NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 3, NUMBER 42 DECEMBER 22, 1986

Programmers wanted: free air travel, top pay
experience with TPF a must

Transaction Processing Facility = designed in 1960
Original name = Airline Control Program
Application = On-line transaction processing
Number of Companies using TPF ≈ 50
Current users = American Airlines, Inc. Visa USA, Inc., American Express Co., Bank of America National Trust and Savings Association
Newest application = Automated teller machine networks
Number of TPF programmers = 3,500
Salary range = $45,000 to $60,000
Inducements = Cash bonuses, free air travel, opportunity to work on challenging projects

▶PROGRAMMER PAUCITY

Large users seek TPF gurus ASAP

Battle for scarce skills waxes.

BY PAUL KORZENIOWSKI
Senior Editor

The dearth of programmers skilled in IBM's Transaction Processing Facility (TPF) is forcing managers of some of the nation's most sophisticated networks to offer cash bonuses, free travel incentives and even carte blanche project control in an effort to recruit TPF experts.

Banks, airlines, insurance companies and hotels are frantically searching for programmers with experience working with TPF, a specialized operating system developed for applications that require quick access to a data base and the ability to update data base

See **TPF** page 6

▶TELECOM TURMOIL

AT&T idles 27,400, takes $3.2b bath

Bell Labs, regulated operations to suffer least.

BY PAM POWERS
Senior Editor

NEW YORK — AT&T revealed details of extensive cost-cutting plans last week, calling for a $3.2 billion charge against earnings in the fourth quarter and the elimination of 27,400 positions by year-end 1987. But the company offered little insight into how it intends to implement its refocused marketing and manufacturing efforts.

AT&T said the multibillion-dollar charge — a result of costs incurred from layoffs, facilities consolidation and asset write-downs — would slash earnings for the fourth quarter by $1.7 billion. The company said the reductions would not have a positive effect on earnings until sometime in 1988. According to Joel Gross, vice-president of research at Dean Witter, Reynolds, Inc., "1987 will be a flat year for AT&T."

Securities analysts who attended an AT&T-hosted conference here voiced frustration about the company's reluctance to discuss specific areas targeted for consolidation. They said talk of a coherent marketing strategy was noticeably absent.

Approximately one-third of the one-time charge against earnings is related to layoffs

See **Layoffs** page 8

FEATURE FOCUS

Florida network powerhouse takes User Excellence Award

BY PAUL KORZENIOWSKI
Senior Editor

Put 10 people together in an office, and at least one will ferret out a problem or two. In many large corporations, a problem is treated like the weather: Plenty of people gripe about it, but no one offers a solution.

That's definitely not the case with this year's winner of the Second Annual User Excellence Award. Florida Power & Light Co. is structured to address problems, no matter how large or small.

In 1982, the $4.3 billion utility embarked on a 10-year quality improvement program that has had an effect on minor

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NETWORK LINE

News

Hoping to bring market forces more strongly into play, the Federal Communications Commission unanimously proposes streamlining tariff regulations for basic telecommunications services. Page 2.

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When the time comes for EDS to award the contract for GM's fiber-optic network, US Sprint might not get the nod, merger rumors and joint contract bids notwithstanding. Page 2.

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Digital Equipment Corp. braves the challenge of merging voice, data and electronic mail networks into one wide-area backbone network. Page 2.

▼

Hurdles abound in the race for long-distance market share now being run by MCI Communications and US Sprint, both of whom can still only hope to show or place behind AT&T. Page 4.

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Personal computer network users must beware of inconsistencies in the multitude of multiuser applications now being bandied about the market. Page 4.

▼

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The envelope please . . . And the runner-up for this year's Second Annual User Excellence Award is First Wisconsin National Bank, for its decisive, head-on response to a myriad of communications problems. Page 30.

NEWSPAPER

▶HO HO HO HOPES



Dear Santa: Bring network gifts

BY NADINE WANDZILAK
Staff Writer

'Twas three days before Christmas and all through one North Pole house, the staff was working overtime to fulfill the holiday wishes of communications managers by Thursday.

Among the oft-named items on the managers' Christmas wish lists are gateways, microcomputer-to-mainframe links and network test gear, one well-placed source at the top of the globe told *Network World*. Managers are also asking Santa to help them find experienced communications staff members.

Leonard Steinbach, information center manager at the State University of New York Health Science Center in Brooklyn, said he'd ask Santa for a network-to-host gateway "that's easy to install and really transparent to us-

See **Santa** page 8

▶ TELECOM TARIFFS

FCC may leave telecom pricing to user demand

More competition means less regulation.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The Federal Communications Commission last week proposed streamlining tariff regulations for certain basic telecommunications services offered by AT&T and the Bell operating companies in order to allow market forces, rather than the FCC, to dictate the price of those services.

The FCC voted unanimously — five to zero — to issue a notice of proposed rulemaking to investigate the types of services that would fall under this ruling and the manner in which regulations could be streamlined. Only packet-switching and telecommunications services offered under competitive contracts were cited as likely candidates for regulatory streamlining, but a wider range of services may ultimately be affected. The FCC's proposal could lead to significant price reductions for users.

Under the proposal, the tariff-filing process for these services would be simplified and the approval cycle shortened from about three months to two weeks. The carriers would not be required to provide the FCC with the extensive cost-support analysis they currently submit.

"Unnecessary regulations can be a barrier to market entry and competitive pricing," said FCC Chairman Mark Fowler. "We want to allow the commercial process to take effect, and we feel by loosening regulations in markets that are already competitive, we'll see more competitive pricing of services."

William Maher, an official with the FCC's Common Carrier Bureau, said, "The perception among telecommunications users is that there's sufficient competition in certain service areas to allow a loosening of the current regulations." The loosening of these regulations will foster greater price competition in markets that are already competitive, Maher said.

The BOCs and AT&T reacted favorably to the FCC's proposal, although officials from the companies expect a good deal of opposition from current and potential competitors. "The FCC feels it no longer needs to protect consumers in markets where there is sufficient competition," said Patrick A.

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▶ PROPRIETARY NETWORKS

DEC merges E-mail, two internal nets

BY PAUL KORZENIOWSKI
Senior Editor

CONCORD, Mass. — While some users complain about the complexities of merging voice and data networks, Digital Equipment Corp. is busily forging ahead with a project to integrate its vast voice, data and electronic mail nets into a single wide-area backbone network.

"We see opportunities to reduce our telecommunications costs by installing a wide-area network that integrates voice, data and video," said Michael Dougherty, DEC's corporate networks transmission manager.

The high-flying computer vendor has taken a few baby steps toward merging three currently autonomous internal networks. Upon completion, the network will replace more than 275 long-distance voice circuits, provide better quality service to employees, enable DEC's telecommunications department to respond more quickly to user requests and increase the variety of applications the department can support.

Of DEC's three internal nets, Easynet is the best known because it has been hailed as one of the world's largest electronic mail systems. Easynet operates with Decnet and supports more than 12,000 nodes — processors that range in size from a VAXmate to a VAX 8600 — spread around the world.

The second network, Digital Telephone Network (DTN), is based on four Northern Telecom, Inc. SL-1 private branch exchanges, housed at sites throughout Massachusetts and New Hampshire. DTN handles DEC's voice requirements. Throughout New England, satellite offices equipped with a variety of PBXs transfer calls to one of the four nodes, which route calls to their destinations.

DEC's Terminal Switching Network is a packet-switched net provided by Tymshare, Inc. that links terminal users throughout the country. The services are used at sites where there is insufficient traffic to warrant an Easynet VAX node.

A few years ago, DEC examined its three networks and realized that major cost savings could be achieved by concentrating nodes and implementing a single wide-

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▶ EDS/SPRINT

Sprint in hunt for GM net

BY BOB WALLACE
Senior Editor

Despite the close ties US Sprint Communications Co. and Electronic Data Systems Corp. (EDS) have forged to bid for the $4.5 billion Federal Telecommunications Systems 2000 (FTS 2000) contract — and rumors that the two firms may eventually merge — it is unclear whether EDS will award US Sprint the lucrative contract to provide fiber-optic capacity to General Motors Corp.

EDS, a wholly owned subsidiary of GM, has been evaluating the fiber nets of several carriers but has yet to choose which vendor's facilities will be used to complete the three-tier, digital communications network EDS is building for GM.

EDS spokesman Tony Goode said the company completed its evaluation of US Sprint's fiber-optic network facilities more than a month ago and has begun evaluating other carriers' networks. He would not divulge details of the evaluation. US Sprint spokesman Syd Courson maintained however that the two companies are still discussing possible use of the nationwide fiber-optic net US Sprint is building.

EDS may also be intending to use fiber net capacity to support its new division, Electronic Data Systems Communications Corp., a company formed to provide users with turnkey communications systems, including transmission services. EDS last week said use of the fiber capacity would not be restricted to GM ("EDS spins off network unit," *NW*, Dec. 15).

US Sprint and EDS canceled a press conference scheduled for today during which the two were expected to announce the FTS 2000 partnership. A US Sprint spokesman explained the duo had decided to wait until the U.S. General Services Administration distributes the final version of the FTS RFP at the end of this year before announcing their intention.

The 10-year FTS 2000 contract calls for the design, implementation and management of the voice, data and video network to be used by 1.3 million federal employees in more than 3,500 locations.

Goode said widely published rumors that the two companies are planning to expand their current

See **Contract** page 8

Correction:

A column in the Dec. 15 issue of *Network World*, "Data dialogue ditties," incorrectly listed the defendant in a patent infringement suit filed by IBM. The suit, which was settled out of court, was filed against NCR Comten, Inc.



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▶ LONG-DISTANCE STRATEGIES

MCI, US Sprint mired in AT&T's wake

BY PAM POWERS
Senior Editor

In the tortuous race for market share run by AT&T's principal challengers, MCI Communications Corp. and US Sprint Communications Co., the road is fraught with pitfalls that continue to slow the progress of the second- and third-place long-distance companies.

Despite some success in landing large business customers and crafting as yet incomplete state-of-the-art networks, both MCI and US Sprint are laboring to make do with heavy costs and a limited revenue pool. While the companies have achieved much to date, deepening debt may defile their financial performances for some years yet.

Said Glenn Powers, a senior analyst with Northern Business Information, Inc., a New York-based consultancy, "the carriers are in an extremely high negative cash flow business."

The backing of US Sprint's corporate parents, GTE Communications Corp. and United Telecommunications, Inc., is a boon for the company, as it continues to outlay enormous sums to build a nationwide fiber network. But the company has just passed the halfway point in its upgrade project, and the end of the tunnel is still millions of dollars away.

In the meantime, US Sprint is losing a significant amount of money, $17.1 million in the third quarter ended Sept. 30 (its first quarter as a joint GTE/United Telecom venture), according to its financial statements, and the company has warned of continued losses, at least into the fourth quarter.

> *"US Sprint is losing a significant amount of money."*

GTE recently indicated plans to invest a good deal of money in US Sprint next year, above and beyond what US Sprint has already budgeted for network construction, according to Mike Kennedy, a vice-president with Gartner Group, Inc. in Stamford, Conn. "GTE obviously plans to operate US Sprint at a loss for a while," he said.

The state of MCI's financial health was brought to light recently when the company announced a 15% reduction in staff and a $500 to $700 million pre-tax charge in the fourth quarter of this year, which will result in a large fourth quarter loss. The telecommunications concern's third quarter earnings were $17.9 million, compared to $30.3 million the year earlier.

Adopting a conservative posture, MCI decided to trim spending now in order to realize better profits later. This new stance necessitated a companywide consolidation and a $100 million reduction in capital spending. Additionally, funds

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▶ TECHNOLOGY TREND

Multiuser applications a mixed bag for PC users

BY PAULA MUSICH
Senior Editor

The wait for multiuser personal computer applications may not be over for all personal computer network users, even though a multitude of such applications is finally available.

Because of the inconsistent implementation of multiuser functions and uneven development efforts across different categories of software, users cannot assume an application is multiuser simply because it runs on a personal computer network.

Most major personal computer applications developers have released true multiuser versions of their products. Top-selling word processing programs such as Word Perfect Corp.'s Word Perfect and Microsoft Corp.'s Microsoft Word offer true multiuser support, as do best-selling data base management systems including Ashton-Tate's dBASE III Plus and Microrim, Inc.'s R:base Series 5000.

Among the major personal computer applications developers, the only laggards appear to be Lotus Development Corp., with its 1-2-3 spreadsheet, and Ansa Software Co., with its Paradox data base manager. Lotus plans to bring out the Networker, a multiuser version of 1-2-3, in the first quarter of 1987, and Ansa is working on a multiuser version.

Among the available applications, the multiuser capabilities implemented within the programs vary widely. Just because a vendor says a program will run on a network doesn't mean it is really a multiuser program. Novell, Inc., for example, offers a Netware-Compatible Software Directory that includes hundreds of single- and multiuser titles.

Software can be compatible with DOS 3.1 — the standard for networking personal computer applications — in single-user mode without making use of its networking function calls.

Developers can also choose to implement an incomplete set of the multiuser capabilities offered in DOS 3.1. Some applications don't require that all of DOS 3.1 function calls be implemented, according to Jim Allchin, vice-president of software at Westboro, Mass.-based Banyan Systems, Inc. "Most word processing programs only require file locking, as opposed to record locking, because users work with a whole document at a time," he said.

Some word processing programs go a step further by improving on weaknesses in DOS 3.1 function calls. Although DOS 3.1 includes a call for sharing peripherals, Word Perfect makes it easier to use the network printer, according to David Hills, Novell's manager of independent software vendors. Microsoft Word includes an embedded Novell printer command for print spooling, he added.

Single-user data base management system developers face the toughest challenge in providing their programs with true multiuser capabilities. Implementing record-locking functions is no small task, according to Norman Fujiyoshi, Banyan's senior staff software engineer.

Fujiyoshi and Hills agreed that DOS 3.1 is limited in the multiuser capabilities it provides data base developers. "You can't just use DOS 3.1 functions. You need more complete control of who has the data base open from the user's point of view. There are not enough controls within DOS 3.1 to ensure the integrity of the data base," Fujiyoshi said.

Security is another problem area for most available multiuser data bases. Most of the programs require the user to write applications programs that implement security parameters, such as setting up passwords for system administrators and defining privileges for users. R:base Series 5000 allows users to develop extensive security parameters but requires programming expertise. dBASE III Plus attempts to make it easier for users but is less powerful, Fujiyoshi said.

Other primary categories of personal computer applications software such as accounting, integrated programs, computer aided design and desktop publishing packages have been slow to implement multiuser capabilities. Hills believes that spreadsheets "aren't there yet," but that this will likely change with a Lotus multiuser spreadsheet.

Fujiyoshi believes personal computer developers and local-area network users have just scratched the surface of what's involved in moving from a single-user mode of operation to a multiuser environment.

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ABC

▶ LAN ALTERNATIVES

Pac Bell arm bypasses Ethernet for Apollo net

BY MARY PETROSKY
West Coast Correspondent

SAN RAMON, Calif. — Rather than vie with thousands of users for access to a sitewide Ethernet local-area network, Pacific Bell's Disbursement Accounting Group opted to provide its staff of 500 with its own network based on $1.5 million worth of gear from Apollo Computer, Inc.

The network was installed last spring when the Group moved from San Francisco to a new complex in San Ramon. The Group's staff, a mix of programmers and analysts, was shifted from terminals to personal computers. Eventually, however, the Group expects to have a mix of Apollo workstations and personal computers.

The Group is involved with development and maintennance of mainframe applications and writing documentation and reports. Network requirements include providing users with mainframe connections, as well as with access to shared resources within the group. Some users also need to communicate with other departments, as well as access remote corporate resources.

The Group evaluated a number of network solutions, including those offered by Burroughs Corp. and AT&T. The Apollo network was chosen, in part, because its 12M bit/sec token-passing architecture offers relatively high-speed performance, said Mike Frees, associate systems analyst for Pacific Bell. In addition, Apollo allows personal computers to tie into its network, providing the Disbursement Accounting Group a growth path from its micro-oriented environment to a more workstation-oriented one, Frees said.

The network is currently configured with several hundred AT&T 6300 and IBM 3270 Personal Computers, a handful of IBM Personal Computer XTs, the 13 Apollo DN300 superminicomputer workstations, 59 Apollo servers and more than 30 laser printers.

A combination of Apollo DSP80 and DSP90 servers provide peripheral, file and compute server functions. These 32-bit computers are based on the Motorola, Inc. 68000 family of microprocessors.

The accounting group also liked the Apollo network's mail system, and the file and process-sharing capabilities of its servers. By running an Apollo program called PC Interconnect, which is based on Microsoft Corp.'s MS-Net, personal computer users get typical personal computer network functions. PC Interconnect also provides terminal emulation so these users can run applications on the Unix-based Apollo workstations and servers.

In addition to providing connectivity for the personal computers, the Group also required connections to IBM, Data General Corp. and Burroughs mainframes, as well as to the facilitywide Ethernet net.

Although the Apollo network cannot currently support all these connections, Apollo is working with Pacific Bell to provide custom software that will do so.

The new complex's installed wiring posed an interesting challenge for the network planners. A twist

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▶ COBOL APPLICATIONS

Austec inks software license pacts

BY MARY PETROSKY
West Coast Correspondent

SAN JOSE, Calif. — Austec, Inc. last week said it had signed licensing agreements with AT&T and Gould, Inc. for its line of networked COBOL software tools, which one early user said simplify the development of distributed COBOL applications.

IBM, Digital Equipment Corp. and NCR Corp. are among the vendors already distributing Austec's products. At the heart of the Austec line is Acenet ("Austec net tool out," *NW*, April 21), which acts as a virtual operating system and allows programs written in Austec's AceCOBOL to run on any computer in a network. An Acenet-equipped processor running an AceCOBOL application can access other Acenet machines in a network for data or files.

AceCOBOL is a COBOL language compiler with syntax extensions that provide source code compatibility with other vendors' COBOL offerings, including Data General Corp. COBOL and Micro Focus, Inc. COBOL.

According to the agreement, AT&T has a 3-year, worldwide contract to market Austec's products for its 3B line of Unix-based minicomputers. AT&T would not disclose when it would begin marketing the products, which an AT&T spokesman said the company is still testing.

Gould has been selling AceCOBOL for nearly a year and will begin to sell Austec's other products in the first quarter of next year, said Chris Howkins, manager of OEM products at Gould. Gould will be selling the COBOL products worldwide for its Power Node 6000 and 9000 Series minicomputers. Gould's distribution agreement runs through 1999.

> *"AT&T has a 3-year contract to market Austec's products."*

The U.S. Department of Transportation has been working with the Austec products for more than a year to develop an administrative management system for the Federal Aviation Administration (FAA), according to Charles Toye, computer specialist and program manager for the project. The system will be used in several hundred FAA offices around the country, Toye said.

More than 300 applications, including scheduling, personnel administration, and time and attendance tracking are being developed with AceCOBOL or recompiled to run under it, Toye said. Although many of the applications were developed to run in a networked DG environment, AceCOBOL's portability is allowing Toye and his group to evaluate other hardware for the system. Most recently, Toye tested AT&T's 3B hardware and the IBM RT Personal Computer.

"One of the advantages of Austec's products is they run on a number of machines," Toye said. "If we didn't have these products we would not be able to port over to different machines, except at a fantastic cost."

Toye also finds the network functions built into Acenet a definite plus. "It's very difficult in any language to construct a network," Toye said. Since Acenet has many multiuser routines built in, Toye and his group do not need a separate piece of software to provide file server functions. "That makes it nice; you don't have to rely so much on the operating system.

"The less software you need, the better. It cuts down on overhead and gives you more control," Toye said. The FAA system is being designed for an average of 20 users, which may be on DG equipment, multiuser systems or even personal computers networked together. Toye expects to make a final decision on the hardware in March.

▶ DISTRIBUTION

Centel to sell for Mount. Bell

Marketing and support cited.

BY KARYL SCOTT
Washington, D.C. Correspondent

DENVER — Mountain Bell has signed Centel Business Systems as a distributor for its business telecommunications products and services in Colorado, Arizona, Utah and Montana, Mountain Bell officials announced last week.

Centel will take over most of Mountain Bell's marketing and support for corporate accounts in return for a commission. Mountain Bell's own business information systems will act as a systems integrator, providing customers with the components necessary to provide end-to-end services.

Mountain Bell called the Centel deal a major agreement. Centel is the second largest distributor Mountain Bell has signed to market its services in the two years that it's been using third-party distributors. The largest is Mountain Bell's sister company, US West Information Systems, the customer premises equipment subsidiary of US West, Inc., the regional Bell holding company that owns Mountain Bell.

Centel Business Systems is a subsidiary of Chicago-based Centel Corp. Centel Business Systems has an installed base of 940,000 lines nationwide.

The services Centel will market include Centron (Centrex), Premise Inside Wire, Direct Inward Dialing, Digitron high-speed digital services ranging from 2.4K bit/sec to T-1 capabilities, Infospan analog private-line service, Lightway fiber-optic private-line service, Remote Call Forwarding, Wats and 800 services.

"This agreement is a plus for us," said Greg Taylor, vice-president and general manager of Centel's Western Division. "We've always worked with Mountain Bell on behalf of our customers, but now we'll be compensated for recommending Mountain Bell services." Centel has similar agreements with other BOCs as well.

The use of third-party marketing is part of Mountain Bell's long-term strategy, said company spokesman Phil Allen. "This makes a great deal of sense for us since customers want one-stop shopping and we can't sell CPE. Through sales agents, we can help customers acquire all the communications components they need from a single point of contact."

Mountain Bell sees itself as a wholesaler of communications facilities in large business markets. "This is an approach we're relying on more and more with large corpo-

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▶ NORTHERN TELECOM

Centel buys Midwest regional sales unit

BY MICHAEL FAHEY
Staff Writer

CHICAGO — Northern Telecom, Inc. continued its withdrawal from the direct equipment sales business last week by selling the Midwestern arm of its Integrated Office Systems division to Centel Business Systems.

The deal marks the second time in a month that Northern Telecom has sold one of its regional sales and service units. Late last month, Northern Telecom sold its Western region sales and service arm to Pacific Telesis Group.

Under terms of the Centel agreement, about 200 Northern Telecom employees, including salespeople, technicians and administrative personnel, and other assets will be transferred to Centel for about $10 million. Northern Telecom's Midwestern operations included Illinois, Indiana, Michigan, Ohio and Wisconsin.

Responsibility for support of an installed base of roughly 400 private branch exchanges supporting 140,000 lines in those states will also be transferred to Centel. The move strengthens Centel's presence in Ohio and marks the company's entrance into the Indiana and Michigan market, according to Stephen Vanderwoude, president of Centel Business Systems.

With the acquisition of Northern Telecom's Midwestern operations, Centel maintains over one million lines nationwide, company officials said. Earlier in the year Centel acquired M/A-Com Informations Systems, Inc.

"Our intention is to be a full service communications and data systems integrator," Vanderwoude said. "This acquisition helps us accomplish that objective." Vanderwoude added that Centel had no specific plans to make additional acquisitions but, he said, the company is "considering other opportunities." For five of the last six years, Centel has been the largest distributor in the U.S. of Northern Telecom equipment.

Robert Potter, group vice-president of Northern Telecom's Integrated Office Systems division, said the sale of its Midwestern sales and service branch simplifies the company's distribution channels and avoids the conflict between direct selling and distributed selling in the Midwest.

Northern Telecom now has three remaining regional operations through which it sells equipment directly to end users. Potter declined to comment on whether his company had plans to sell any of its remaining sales and service operations, but he said the Eastern region, from Washington, D.C. to Boston, was definitely not for sale.

Potter said the two recent sell-offs of sales and service operations does not indicate a dramatic change in Northern Telecom's sales and marketing strategy.

DEC from **page 2**
area network.

The company forged a long-range plan for integrating various circuits and moving in-house some functions supplied by the telephone company. Eighty miles of fiber cable were installed to link 23 New England offices located primarily in Massachusetts and New Hampshire. Nynex Corp. supplied DEC with T-3 multiplexers, which operate at speeds of 45M bit/sec, from AT&T. Primarily, the fiber connects buildings where DEC already owned the rights-of-way needed to lay cable.

The second step was determining the best method for linking 11 DEC central sites on a long-haul network. DEC was supporting 13 lines, ranging in speed from 19.2K bit/sec to 56K bit/sec for digital transmissions, and 275 voice circuits. Dougherty was chosen to oversee that evaluation and moved from DEC's Philadelphia office to Concord.

> *"DEC does not plan to sell excess capacity on the network."*

The company undertook a 9-month study that examined three network approaches and 18 vendors' equipment. The approaches considered included use of D-4 channel banks, point-to-point T-1 multiplexers and switching T-1s.

DEC eventually decided that switching T-1s would provide more flexibility for network design, provide better cost control capabilities and improve network performance more than the other options examined.

Network Equipment Technologies, based in Redwood City, Calif., and Cohesive Networks Corp., with offices in Los Gatos, Calif., were the two primary candidates. NET was finally chosen because its product could handle bandwidth allocation.

The first step in the T-1 network implementation, which was completed in November, was the installation of four T-1 lines to link DEC's offices in New England to those in Washington, D.C. In the next few months, the company plans to add other remote sites to the network. "The next site we'll do will be the one with the highest payback," Dougherty said.

Once the backbone network is in place, DEC plans to continue adding to its network capabilities. First, the fiber network may be expanded to support transmission at 90M bit/sec. Then the T-1 network may be expanded to include district offices. Eventually, the company would like to link foreign locations onto the net.

Unlike competitors such as Data General Corp., DEC does not plan to sell excess capacity on the network to its customers. "We don't see an appealing profit picture in the reseller market," Dougherty said. "So, in the short term, it doesn't make sense for us to pump a lot of energy into that market."

Network management has presented a thorn in Dougherty's side. He longs for an integrated network management package that could control all network components. IBM has given its users such a product, Netview. "I really don't have any advance notice of any upcoming network management products, but it wouldn't surprise me if DEC announced a package similar to IBM's," Dougherty said.

TPF from **page 1**
records instantly.

Users are expanding their TPF-based nets and finding new applications, such as automated teller machine (ATM) networks, for the product.

That has sparked a bidding war resulting in high salaries and valuable perquisites for the roughly 3,500 programmers knowledgeable about TPF.

Developed in the 1960s

IBM developed TPF, originally known as the Airline Control Program (ACP), in the late 1960s as part of an airline reservation system designed to run on mainframes. The product has been enhanced through the years so that it currently can process up to 1,000 transactions per second.

Among current TPF users are some of the nation's largest companies, including American Airlines, Inc., American Express Co., Visa USA, Inc. and Bank of America Corp.

Despite TPF's impressive processing capabilities and client list, analysts estimate that less than 50 companies work with it. One reason is that the product is difficult to manage because it is a unique operating environment and applications that run with it have to be written in assembler, a language in which few commercial applications are written.

Because of the product's limited acceptance, there is a relatively small pool of TPF programmers. Historically, supply for TPF programmers has always outstripped demand. But in the last few years, as the number and variety of TPF applications steadily increased, and as IBM began aggressively marketing the product, demand for programmers became increasingly greater than supply.

Companies that built their corporate future on completion of TPF networks or applications have begun to raid other TPF shops. Substantial raises and fringe benefits such as free air travel are two items being offered to TPF programmers who jump ship.

Current employees are being offered finder's fees of $3,000 or more for every TPF programmer they help lure away from other MIS departments.

But extra cash and attractive fringe benefits often are not the primary reason why a TPF programmer migrates to another company.

Fred Stout, manager of the ACP/TPF product group at the Computer Task Group, Inc. in Cincinnati, said the most effective lure is the opportunity to work on a complex project or application.

"TPF programmers are first-hand technicians and are always interested in working on elegant new applications," he said.

Some ill feelings

The seduction of TPF programmers has created some problems. First, the quality of some TPF projects has slipped as inexperienced technicians took over supervision of complex projects. Second, the bidding wars created ill feelings in some large programming departments.

Generally, programmers are paid between $30,000 and $60,000. TPF programmers tend to fall at the high end of the scale, which makes counterparts, such as COBOL programmers, envious.

"Some COBOL programmers wondered why we weren't offering them first shot at the higher salaries," noted one communications manager who did not want to be identified.

To solve the problems, Computer Task Group started an in-house TPF training program. Programmers who have a working knowledge of assembler can start working on TPF projects after three weeks of training.

In response to customer requests for help in training employees, IBM has widened the breadth of its training materials, according to Henry Meyer, president of the TPF users group.

Third parties have also benefited. Computer Task Group conducts TPF training classes and supplies TPF consultants. Stout said that recently the company has noticed a marked increase in its TPF business.

The added training could help to ease the shortage, but no one expects the supply of programmers to catch up with demand in the near future.

▶ PRIVATE NETWORKS

Amoco Pipeline opts for VSAT net

New system is expected to save 30% to 40% in next five years.

BY NADINE WANDZILAK
Staff Writer

CHICAGO — Dissatisfied with maintenance headaches and the cost of private lines, Amoco Pipeline Co. has signed on with Equatorial Communications Co. for a 500-dish private satellite net.

Compared to the company's present leased line network, the very small aperture terminal net, which will be installed beginning in March, will save Amoco Pipeline 30% to 40% during the next five years, according to Josh Akan, manager of transportation services for Amoco Pipeline.

The company, headquartered here, will use 300 of the 500 earth stations to replace the leased lines it currently uses to link 10 regional pipeline control centers with remote pump sites.

Amoco Oil, parent company of the pipeline concern and the company that actually contracted for the network, would not specify how the remaining VSAT stations would be used. The company also would not comment on the value of the contract.

Deteriorating maintenance

Amoco Pipeline has had its terrestrial leased-line network for 10 years, Akan said. But since the breakup of AT&T, the company has been disturbed by deteriorating maintenance, principally the amount of time it took to get service.

The company was also frustrated by AT&T and local telephone companies blaming network problems on each other, he said.

"In the meantime, we were losing valuable communications," Akan said. "Our operators at the control centers were frustrated. For reliability and the safety of the operations, the company needs its communications channels open all the time. We're hoping the satellite net will be close to 99% reliable."

When coupled with the leased-line rates hike predicted by Amoco's corporate Telecommunications Department, the service dissatisfaction encouraged Amoco to look to satellite technology.

Lowest cost option

Akan said Equatorial's two-way EquaStar satellite transaction network offered what Amoco felt was the least expensive one-time cost.

As part of the satellite network project, Equatorial provided software for Amoco's Remote Telemetry Units (RTU), which gather and relay data from pipeline pump stations to regional control centers. The software converts RTU-to-leased-line communications to RTU-to-satellite-dish connections.

While the polling frequency will be determined by the functions that individual RTUs perform, Akan estimates each device will be interrogated every 10 seconds. Transmissions are routed through Equatorial's master earth station in Mountain View, Calif.

A pipeline operator in a regional control center can control a pipeline valve or pump through a remote RTU. Network management is provided by Equatorial from a network control center at the master earth station.

Switch to satellite was easy

It was not difficult to switch to satellite technology, according to Akan. Still, Amoco refrained from putting all its eggs into one transmission basket.

From June through September, the company tested six earth stations on one section of the pipeline in Oklahoma in parallel with existing leased lines.

When full network implementation commences in March, the first earth stations installed will support a segment of pipeline in the company's western division, which is controlled by the Denver regional center. The remaining dishes will be installed on the pipeline in the next two years.

Streamline from **page 2**

Hanley, assistant vice-president of federal regulatory affairs at Bell Atlantic Corp. "This is good news for us."

Albert Halprin, Common Carrier Bureau chief, said, "If a carrier is willing to offer a service below the tariffed rates, then why should the FCC deny that."

> *"The FCC realizes the need to prevent unfair pricing."*

While the FCC hopes to foster market-based pricing of telecommunications services, it realizes the need to prevent unfair pricing and cross-subsidization of profits from monopoly services to competitive services.

As part of the streamlining, the FCC is expected to enact safeguards to prevent cross-subsidization. The net revenue test would be an adequate safeguard in this area of regulated competitive services, according to observers.

With the net revenue test, the FCC looks at the revenue derived from a particular service and the cost associated with providing that service. As long as the revenue is adequate to cover the cost, it is clear that cross-subsidization is not taking place.

While last week's action is the first step in what many observers said will be the next major wave of deregulation, the ruling did not involve a revamping of current rate-of-return regulations, as some had expected.

FCC Commissioner Dennis Patrick recently suggested substituting a price cap safeguard in certain service areas for current rate-of-return regulations. Rate-of-return regulations control the profits dominant carriers may earn. Patrick's proposed alternative would set a cap on the rates AT&T and the BOCs can charge for selected services, giving the carriers greater flexibility in pricing services than the streamlining rules would foster.

Centel from **page 5**

rate customers," Allen said.

Thomas Cullen, staff manager for new business development at Mountain Bell, said, "The wholesale approach allows us to sell to the large business accounts we want to reach without having the cost of a separate sales force. The agreement with Centel gives us a presence in the upper end of the business market in our targeted niches, such as financial and health care markets, but helps us keep our expenses down."

Mountain Bell would not reveal the terms of the single-year contract with Centel except to say it was a significant amount. Centel has agreed to sell a prescribed dollar amount of Mountain Bell services and will receive a commission from Mountain Bell for those sales.

Mountain Bell has phased out most of its business sales force since divestiture and now employs only a few marketing administrators for business customers who want to deal directly with Mountain Bell. At divestiture, Mountain Bell had several hundred salespeople marketing to business accounts.

Second from **page 4**

allocated for network upgrades have dropped from an initial sum of $900 million to $800 million in 1987.

Although MCI and US Sprint share the same competitive burdens of trying to expand and enhance their networks while maintaining prices lower than AT&T's ever-shrinking rates, they part company when it comes to responding to these pressures.

While MCI is paring staff and capital funds earmarked for network expansion plans, US Sprint is engaged in an aggressive nationwide advertising campaign to promote an end-to-end fiber-optic network, highlighting the heavy commitment of funds to network upgrades.

The company poured $1 billion into laying fiber this year, and plans to spend the same amount in 1987. Of a planned 23,000 fiber route miles scheduled to be installed by year end 1987, US Sprint has now laid 14,500.

US Sprint has also landed some significant contracts recently. It now boasts such names as Honeywell, Inc., Unisys Corp., American Express Co., Sears, Roebuck and Co., Singer Corp. and F.W. Woolworth Co. as clients. The customer base currently totals 4.7 million, according to a spokesman.

For its part, MCI claims to do business with 450 of the Fortune 500, including Martin Marietta Corp., Wang Laboratories, Inc., IBM, Security Pacific Corp., JC Penney Co., Inc. and Westinghouse Electric Corp. Although MCI has traditionally been stronger in this market segment than its rival, US Sprint now appears to be narrowing the gap.

Despite cutbacks, MCI still has a jump on US Sprint, with a larger network of 32,000 route miles (year end 1986) and approximately five million customers. By the end of the year, the company expects to have 479 million circuit miles, some 177 million of which will be digital. The company said it has reduced its reliance on the AT&T network to 1.9%. US Sprint said it is "not interested in making public" its current reliance on AT&T.

MCI remains AT&T's No. 2 competitor, with some 8% of the domestic equal access market, while US Sprint trails MCI with a 4% share, according to analysts.

But, "US Sprint is obviously doing a good job of coming from behind," said Neil Yelsey, senior telecommunications analyst with Salomon Brothers, Inc. in New York. He said both MCI and US Sprint are financially sound, despite their current problems.

Powers posited that US Sprint could possibly upset MCI to become the No. 2 carrier. US Sprint's aggressive marketing tactics could reap great rewards for the company, he said.

Yet both Yelsey and Kennedy concede that the technological differences between MCI's and US Sprint's networks are probably insignificant. "A lot of what's going into these networks is overkill, but US Sprint has done a great marketing job with its fiber-optics ads. MCI will have trouble countering that," Powers said.

"The fiber network is a reasonably strong marketing ploy," asserted Robert Wilkes, deputy manager of Brown Brothers, Harriman and Co.

"But customers should have questions regarding the infrastructure of the company. US Sprint is much smaller than MCI. How can they in the long run provide the same services as MCI and AT&T, when the other two have larger revenue bases?"

▶BLUE NEWS

10,000 IBMers retiring

Computer giant swallows $250m charge.

BY PAM POWERS
Senior Editor

NEW YORK — IBM said last week that an unexpectedly large number of employees, some 10,000, signed up for the company's early retirement program, but even more workers are targeted for layoff in an effort to slash spending as the company prepares for what looks to be a lean 1987.

IBM also said it will take a $250 million one-time charge against earnings in the fourth quarter to cover costs of the program that affects the U.S., Canada, the UK, the Netherlands and France.

The early retirement plan, announced in September, was only expected to draw about 4,000 employees. Under terms of the so-called five-by-five 1986 retirement incentive program, employees were allowed to calculate their retirement by adding five years to their IBM careers and five years to their actual age to meet the minimum requirement of 10 years of service and the minimum age of 50 years. IBM said response to the program was far greater than expected.

The company now employs about 405,000 people worldwide, with some 238,000 in the U.S. No estimates were made as to how many more would take retirement in the coming year or to what degree the savings would affect the bottom line in 1987 and beyond.

In addition to staff reductions, IBM indicated it will implement other cost-saving procedures, including facility consolidations.

Analysts said IBM will suffer a precipitous decline in earnings in the fourth quarter as a result of the one-time charge.

IBM expects the retirement program and other actions, including redeployment of 8,500 employees worldwide, will produce "substantial savings in the last half of 1987 and subsequent years."

At the close of the third quarter of 1986, IBM reported its most severe profit decline in recent history. Earnings dropped from $1.47 billion on revenue of $11.7 billion in the corresponding quarter of 1985, to $1.08 billion on revenue of $11.91 billion in 1986. Revenue increase represented a mere 1.8% increase from the same time last year. The company said it has not initiated a hiring freeze but has limited hiring for the time being.

IBM Senior Vice-President C.B. Rogers Jr. has been named to head the corporate operations staff, a consolidation of the corporate services and operations staffs.

Santa from **page 1**

ers." In the parlance of the season, he wished, "that God had not given DP the Tower of Babel." Steinbach would also ask Santa to stuff his stocking with "a subscription service that lists and evaluates training and seminar services."

George Oakley, assistant vice-president of Glendale, Calif.-based Security Pacific Automation Co., a subsidiary of Security Pacific National Bank, hopes he'll get a distributed data base management system (DBMS). His dream distributed DBMS, he said, would feature invisible download capabilities, "where a user could request data and the system would go out and get it without the user having to know exactly where it was."

"It would also be nice to have users be able to back up their hard disk and share data among other PC users by using a virtual disk," he said. For himself, Oakley wished for a fully configured IBM Personal Computer AT.

On the telecommunications side of the house, Charles Garrison, telecommunications director for the Chicago Board Options Exchange, said he'd ask Santa for some employees with broad technical expertise. "It seems we have a lot of people with a little experience here and there, but very few good generalists," he said. "Some people know switch software. Some know something about networking. Some know about the industry's specialized telephone equipment. But very few people know how to tie them together."

Garrison also requested that the "grinches" — some inexplicable problems — that suddenly cropped up in his telecommunications switch this season be sent home before they steal Christmas from him and his staff.

To identify and solve network and hardware problems quickly, Joyce Kane, manager of voice communications for Washington, D.C.-based U.S. Air, Inc., would ask Santa for test equipment. The problem is not that test equipment is unavailable but that the company's communications budget is tight, she said.

Being able to pinpoint net and hardware problems quickly would stop finger pointing, and help users tell vendors, "this is the problem, right here," she said. Monitoring and diagnostic tools would save time for her and her staff, and reduce overall network downtime.

Along the same lines, Richard Reed, manager of data communications for the New York Department of Motor Vehicles, wants to find a line performance monitor under the corporate Christmas tree. The department has just started to look for a line monitor, and Reed said it expects to purchase one in the next six months. "But depending on what we select, we may run into a budget problem," he said. Thus, Reed would like Santa to select the monitor, pay for it, and get it up and running.

Chafing at long lead times to get internal approval for equipment, James Gregory, project leader in data communications systems in the U.S. Army's Automated Logistics Management Systems Activity in St. Louis, Mo., is hoping for a "streamlined procurement process."

As a gift to users, and indirectly, to himself, John Arechavala in the U.S. Army Information Systems Command, East Coast Telecommunications Center in Frederick, Md., is wishing for "exactly the right local-area network, one that is easy to use," he said. "Our turnover is high. We can't afford training every 18 months."

And to all a good night.

Layoffs from **page 1**

scheduled to take place between now and year-end 1987. Targeted for elimination are 10,900 management positions, representing approximately 9% of the company's total management work force, and about 16,500 nonmanagement positions, or 8% of that total population. These cuts are in addition to the dismissal of some 5,000 employees in the third quarter.

The company would not specify further what types of positions and what business units would be targeted most heavily by the layoff plan, although Robert Wilkes, deputy manager with Brown Brothers, Harriman and Co. said it appears Bell Laboratories will emerge unscathed and regulated operations will suffer the least of the cuts.

In addition to staff reductions, AT&T will consolidate facilities, including customer contact locations, factories and warehouses. Chairman James E. Olson said final decisions on facilities reductions have yet to be made, but manufacturing was one target area for consolidation. The company will take a $1.2 billion charge in the fourth quarter for costs incurred from that consolidation effort.

The third phase of the plan calls for a $1 billion write-down of certain assets, including an inventory of business communications and office automation products. AT&T declined to give further details, but emphasized its continued commitment to the personal computer and office automation markets.

Olson allegedly enumerated a number of factors that have taken a toll on earnings in 1986, including the Federal Communications Commission's reduction in AT&T's allowable rate of return, erosion of AT&T's equipment lease base, flat sales in customer premises equipment and weak returns in the network systems business, despite recent market share gains.

Attendees said that AT&T reiterated its recently reworked corporate strategy, implying that this would be the vehicle used to improve the company's position. That strategy is to concentrate on its businesses in customer premises equipment, long distance and networking equipment, to become a premier data networking company and a leader in international markets.

Gross said the company upheld its data networking strategy as central to its future profitability. But what was sobering, he said, was the paucity of information provided about that strategy. "It seems the plans are still at the high level, not down lower where they can be implemented to have an effect on the revenue stream."

Analysts reportedly tried to gain insights as to what products would be announced when, but received few answers. AT&T said only that "data networking capability would include communications interfaces, multiplexers and modems," among other things.

Contract from **page 2**

relationship — by way of a merger or acquisition — are false. "There is no possibility of that happening at all," he said. Published reports claimed one of the two companies might purchase, or merge with, the other.

Shortly after its purchase by GM in 1984, EDS set out to revamp the automaker's Common Control Switching Arrangement (CCSA) network provided by AT&T. EDS said the mammoth domestic communications network would, upon completion, feature nine central office switches, 40 to 50 large private branch exchanges and 400 to 500 smaller switches.

A source within EDS Communications Services Division told *Network World* in June that the system was only 35% operational ("EDS building worldwide net," *NW*, June 16).

EDS estimated one-half to two-thirds of EDS' entire staff is working to build the digital network, which will reportedly service upwards of 600 GM locations in the U.S.

Goode said of EDS' lightwave evaluation project, which began several months ago, "We are evaluating other vendors' fiber-optic transmission capabilities. We want to determine what the different vendors' capabilities are. Once completed, we will identify who the vendor or vendors are that could supply what we want from fiber-optic transmission facilities."

EDS is shopping for digital transmission capacity on a nationwide basis, Goode stated. He would not divulge details of when the capacity would be acquired or how much EDS had earmarked for this particular data pipeline purchase.

A source within US Sprint claimed AT&T may have the inside track on the upcoming bulk services contract. AT&T, which is one of EDS's systems integration accounts, is also one of EDS' long-distance service providers. The source said AT&T was working hard to divert EDS' attention from US Sprint to AT&T.

EDS has not restricted its search for fiber-optic network capacity to the three largest long-haul carriers. Martin McDermott, a representative of National Telecommunications Network (NTN), a consortium of seven regional fiber-optic carriers, said EDS contacted NTN about provision of bulk bandwidth.

NETWORK WORLD

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INDUSTRY UPDATE

"Next year, vendors will focus on improving peer-to-peer communications offerings. Manufacturers will be concentrating on communications in order to enable users to better manage their growing environments of distributed systems. 1987 will see advancements in communications, software, and network management starting to catch up with the dramatic downsizing and distribution of hardware.

from **Professional Automation Report and Bulletin**
Forrester Research
Cambridge, Mass.

▶DATA SWITCH DOLDRUMS

LAN sales cloud data switch future

Low cost is not enough to offset flat market.

BY PAM POWERS
Senior Editor

The precipitous climb in local net sales may be lowering the boom on the data switch, once the industry's preferred connectivity solution.

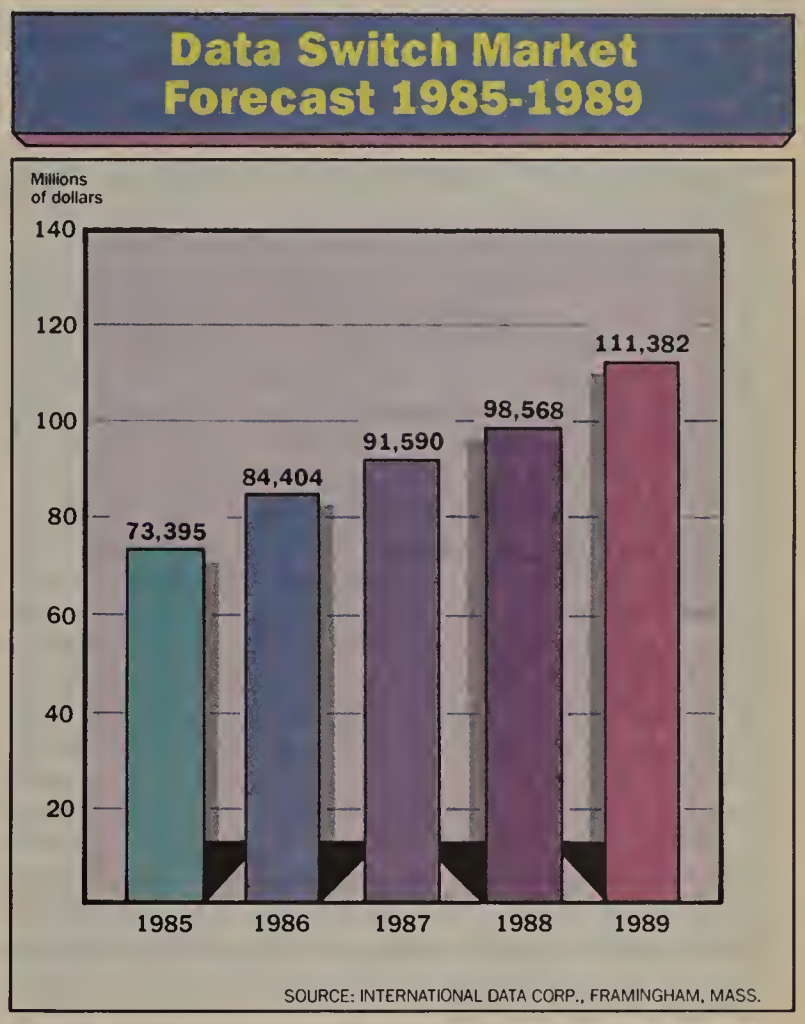
Data switches, otherwise known as port-selection or port-contention devices, are typically used in asynchronous environments to enable a group of users to share computer ports or resources such as laser printers.

Local nets and data switches are complementary in that both provide connectivity functions. But data switches employ circuit switching like telephone systems, meaning communications takes place over connections that are established when needed. And, typically, the switches only support lower speed data and are wired in a star topology, each device wired individually to a central switch.

In contrast, local networks typically support high-speed packet communications and often enable devices to share a common wire.

In 1984 and 1985, some key players in the data switch arena, including Micom Systems, Inc., Gandalf Data, Inc., M/A Com Linkabit, Inc. and Infotron Systems Corp., suffered flat sales and flagging user interest in data switches. This is partially attributable to the rise in prominence of local nets.

See **Data switch** page 10



INDUSTRY EYE
PAM POWERS

Sugarcoating layoffs

Even a casual glance at industry news over 1986 evinces a sobering pattern of cost-cutting measures taken by companies ranging in size from 100 employees to 100,000. The moves made to downsize and achieve better or continued profitability have varied somewhat, but in most cases have involved layoffs. The vocabulary that vendors sometimes summon forth to disguise the reality of layoffs is enormous and invariably, deliberately confusing. At times, it is almost amusing — reduced overhead, reorganization, consolidation, streamlining, manpower savings — all clever obfuscations meaning jobs are to be eliminated.

It is also well worth noting that the smoke screen often dissipates when those same vendors discuss cost-cutting moves with Wall Street. Wall Street understands the absolute necessity of layoffs in an industry characterized by an accelerated ramp-up phase and a subsequent leveling-off in demand. Beset with declining sales and increasing costs in the form of personnel, the solution is obvious, if painful.

Given this state of affairs, the perception is that the general public, including users, would react unfavorably to the concept of layoffs. It certainly isn't palatable in an emotional sense and it possibly conjures images of eventual doom for the stricken company. Nevertheless, economic conditions demand it.

In fact, those companies that have assessed their cost structures are the harbingers of a shift in the way this industry will do business over the next decade. It is axiomatic that technology will improve and prices will drop. In many markets, the products and services different vendors offer will achieve a commodity-like similarity. The focus of the corporate strategy will then shift away from technology to marketing and support functions, where the individual vendor will stand apart from the rest of the brood. When that happens, players will be judged on corporate infrastructure and overall profitability.

So perhaps it's best to call a spade a spade. A pared work force in lean times is as much a testimony to long-term survivability as is an expanded work force in times of abundance.

BRIEFS

KANSAS CITY, Mo. — **United Telecommunications, Inc.** said it will reorganize to integrate the staff functions of **United Telephone System, Inc.** and United Telecommunications' corporate center.

The planned realignment, to take place by Jan. 1, 1987, will effect several personnel changes. Robert H. Snedaker Jr., now acting president of United Telephone, will become United Telecommuications' chief operating officer. John C. Hancock, now executive vice-president and chief technical officer for United Telecommunications, will become executive vice-president of corporate development and technology.

A spokesman said there may be "some reductions" in staff.

LISLE, Ill. — **Tellabs, Inc.** landed a $30 million contract with **Northern Telecom, Inc.** for a DS-3 digital cross-connect system. The 5-year contract is part of a technology exchange between the two vendors.

The DS-3 is designated as the first piece of a family of Northern Telecom products designed to interface 45M bit/sec DS-3 telecommunications facilities. The system will allow telephone companies to manage high-bandwidth digital bit streams.

MELBOURNE, Fla. — **The National Aeronautics and Space Administration** awarded **Harris Corp.** a $12 million contract for a radio system to be used on a new environmental-study satellite. The radio frequency subsystem will sit on the Navy's Remote Ocean Sensing System Satellite, to be launched in late 1990.

Along with other equipment, the microwave radio will examine weather and environmental features of the oceans.

SAN FRANCISCO — Modem vendor **U.S. Robotics, Inc.** said it has added **Hayes Microcomputer Products, Inc.** as a defendant in its pending antitrust suit against Business Computer Corp. (Bizcomp).

Citing what it calls a "Hayes-Bizcomp conspiracy" to monopolize the modem market, U.S. Robotics will ask the federal court here to invalidate the two firms' patents for modem escape sequence technology. Hayes recently announced a program to charge a 2% royalty fee to vendors of Hayes-compatible modems that use that technology.

WESTLAKE VILLAGE, Calif. — **Pacific Bell** said it will not conduct any future work under the master development agreement it has with Incomnet, Inc. Pacific Bell claimed that all obligations under terms of the agreement had been met. Incomnet has at present received $2.5 million of an expected $5.7 million yield from the arrangement. Incomnet is trying to negotiate financing to mitigate the effect of Pacific Bell's action.

▶ WESTERN UNION CORP.

Group offers buy-out bid

Resource Holdings poses offer of $300m.

UPPER SADDLE RIVER, N.J. — Western Union Corp. last week received a second, unsolicited bid of $300 million for control of the ailing company by a group called the Resource Holdings Investors.

Under the proposed terms, Resource Holdings, a New York-based concern comprised of a group of investors, would gain 35% control of Western Union for a $300 million investment. The deal is contingent upon a merger of Western Union with its subsidiary, Western Union Telegraph Co., a settlement with the company's lenders and other terms. Resource Holdings indicated it would sell Western Union's telecommunications assets and put the money toward other acquisitions.

In November, Western Union signed a definitive agreement with Pacific Asset Holdings, Inc., another investment group. Terms of that agreement were similar; Pacific Asset would invest $250 million for control of the corporation.

It was rumored at that time that Pacific Asset would sell parts or all of Western Union's vast transcontinental network. Pacific Asset would neither confirm nor deny those rumors.

In recent years, Western Union has assumed enormous operating losses, attributed largely to a drag in the company's mainstay telex business and ever-increasing competition. Revenue for the 1985 fiscal year dropped to $983 million from $1 billion the year earlier. The company sustained a massive loss of $367 million last year.

The corporation said it will review the proposal but does not expect any action to be taken before a meeting of the board of directors on Dec. 16. A spokesman said that an agreement had been reached with Pacific Asset, but that it contained several contingencies similar to those enumerated by Resource Investors. Western Union would not comment further as to which offer is preferable, saying only that an 8K — a publicly available special report containing information on the Resource Investors proposal — will be filed with the Securities and Exchange Commission.

▶ ACQUISITION ACTION

Clabir Corp. proposes Atlantic Research buy

ALEXANDRIA, Va. — In a surprise filing with the Securities and Exchange Commission, Clabir Corp., a defense electronics company, said it intends to acquire Atlantic Research Corp., maker of data communications diagnostic and military equipment.

Atlantic Research has advised stockholders that the company is best served as an independent entity, but would not comment further on pending action.

Nearly 80% of Atlantic Research's 1985 revenue of $234.3 million came from military equipment, with some 16% coming from data communications diagnostic equipment. Forbes ranks Atlantic Research as one of the 200 best small companies in America.

Clabir holds 100% ownership of General Defense Corp., a military defense contractor, and 80% ownership of AmBrit, Inc., a food business. The company expects fiscal year 1986 (ending Jan. 31, 1987) sales to total $500 million, some $300 million of which will be contributed by defense electronics.

In the filing, Clabir said it holds 7.4% of all outstanding Atlantic Research shares, valued at about $17 million. The company said it intends to purchase all remaining shares through negotiations with Atlantic Research. Failing that, it intends to seek control through open market purchases, private stock purchases or a tender offer.

Although Clabir is not currently in the data communications business, a company spokesman said it expects to operate Atlantic Research as it now exists.

Atlantic Research has retained The First Boston Corp. and Skadden, Arps, Slate, Meagher and Flom, a Wall Street law firm skilled at fighting hostile takeovers.

Data switch from **page 9**

Although data switches are cheaper than local nets, the latter have been perceived as better alternatives for many applications. When the industry as a whole sagged, data switches, always products of marginal popularity, suffered from the same industry malaise. "We've seen the growth rate slow down in this market, and it's now relatively flat," said Doug Hill, Micom's director of data private branch exchange products.

In those two years, sluggish sales forced data switch vendors to realign their products to become parts of a networking whole, accomplished by the integration of local-area networks and matrix switches, increased protocol support and other improvements. The results may stay the death rattle for a few years yet.

One possible catalyst for a data switch renaissance is the recent introduction of cheaper, more modular products to the market, allowing easy installation and gradual growth. This has diverted some attention from local nets.

Equinox Systems, Inc. is generally credited with instigating this trend with the introduction of the DS-5 product. The DS-5 has a small footprint and is easily installed by the user. Doug Noble, marketing manager at Equinox, said the company is still breaking ground at the low end with switches supporting up to 120 ports, but sales are down in comparison to last year. He attributed the drag to increased competition and price erosion, brought about by new products such as those from Micom, Inc. and ComDesign, Inc.

The evolution of smaller systems implies another potential future use for data switches — as servers on local networks.

Low-end products will breathe some life into a market that is otherwise almost saturated. Lee Zipin, product line manager at Infotron, said that Infotron projects flat sales for its high-end data switches in coming years. He said that the role data switches perform is changing to become one of several functions in a total networking solution.

Infotron sells its data switch, the IN4400, in conjunction with its matrix switch, the IN4200, and other T-1 networking products. According to Zipin, the company will soon provide software allowing tandem switching, which will make the data switch part of a high-speed multiplexing product with built-in switching, like Network Equipment Technology, Inc.'s IDNX product.

At the high end, increased functionality and tie-ins with other networking products will be a natural development in the market. Vendors will fight for business with T-1 networking, tandem switching, increased protocol support and reduced prices. With these enhancements and better marketing, the data switch may emerge from its wallflower status to assume some importance as a local networking tool.

But the screws are already tightening. M/A Com has said it will no longer actively seek customers for its data switch. Others may follow. It is advisable, therefore, to take a close look at the vendor and its commitment to the product line because some may beat a hasty retreat as the margins get slimmer and the potential sales smaller.

▶ MODEM MAKERS

Paradyne cutbacks pare staff 9%, costs by $2m

Sluggish modem sales called chief cause.

LARGO, Fla. — Joining the recent tide of corporatewide cutbacks was Paradyne Corp., calling for a 9% staff reduction and an additional $2 million cut in operating expenses for fiscal 1987.

The layoff plan, which went into effect in mid-November, will reduce the work force to 3,300 and is expected to save the company $7 million next year, according to a company spokeswoman, Miriam Frazer.

Staff at headquarters here will be most affected, she said, with only the research and development department untouched.

Like much of the rest of the industry, Paradyne has of late been afflicted with poor financial results. In the nine months ended Sept. 30, the company sustained an earnings loss of $12.2 million.

Data communications equipment — consisting of modems, network management systems, statistical and T-1 multiplexers, and packet switching products — totals 80% of Paradyne's business.

Frazer specifically cited sluggish sales in the modem line as a factor necessitating cost cuts, but said the company has no plans to divest itself of any product lines.

The company said it anticipates some pickup in channel extender, statistical and T-1 multiplexer sales in 1987.

In other action, Paradyne said last week the U.S. District Court of Tampa has postponed its trial with the U.S. government to March 2, 1987. In 1983, a federal grand jury indicted Paradyne for defrauding the Social Security Administration during the procurement process for an intelligent terminal contract.

Frazer said Paradyne continues to do business with the administration, and the agency has renewed its contract until October 1987.

> *"The layoff plan will reduce the work force to 3,300 and is expected to save the company $7 million."*

TELECOM TRENDS

Southwestern Bell buys cellular facilities

The Federal Communications Commission approved the $1.2 billion sale of the majority of Metromedia, Inc.'s cellular telephone and paging facilities to Southwestern Bell Corp. The sale makes Southwestern Bell the nation's largest operator of cellular telephone and paging systems.

Carrier snapshot

United States Transmission Systems, Inc.
(a division of ITT Corp.)

Network route miles: Not available

Transmission media: Fiber-optic cable, analog and digital microwave

Private-line service availability: 54 cities

WATS service availability: 50 cities

Countries served: 22

Major switch sites: Atlanta, Chicago, Cleveland, Dallas, Los Angeles, Miami, New York, San Francisco, Washington, D.C.

Equal access service availability: 35 states

Miscellaneous: 85% of calls handled over digital or analog microwave facilities, 15% of calls handled over fiber-optic cable facilities.

SOURCE: ITT CORP., NEW YORK

CROSS TALK
BOB WALLACE

Users: beware of litigious vendors in RFP process

The city of Seattle's current wrangling with US West Information Systems over alleged improprieties in the city's request for proposal (RFP) process underscores the need for users to pay serious attention to each aspect of this common procedure.

US West Information Systems, claiming the city acted improperly before and after awarding a $6.3 million private voice contract to Contel Business Networks, filed suit against the city ("US West sues Seattle over controversial network RFP," *NW,* Dec. 8).

In its suit, US West Information Systems is seeking either to replace Contel as the network provider or to be compensated for the revenue the company would have received if it had been awarded the contract.

This RFP nightmare has also alienated the city's Bell operating company, Pacific Northwest Bell, which doesn't like the idea of the city possibly reselling capacity on the network.

A Pacific Northwest Bell spokesman claimed the RFP was the most extensive the telephone company had ever seen.

The company apparently went above and beyond the call of duty in assembling the RFP. The city retained two consulting firms, Telecommunications International, Inc. of Denver and Peat, Marwick & Mitchell of Bellevue, Wash., to assist in the preparation of the voice network RFP.

The city also delineated a model that described in detail its chosen network configuration. This added measure was taken, explained Stan Wu, the city's information services director, to allow the city to better compare proposals submitted by the vendors.

Oddly enough, the network model seems to have

See **RFP** page 14

▶ TELEMANAGEMENT SOFTWARE

Program monitors bills, resources

New software helps track telecom systems.

BY BOB WALLACE
Senior Editor

What you don't know can't hurt you, unless you are a telecommunications manager who has lost track of the services and equipment that constitute your company's communications network.

It is not uncommon today to find communications billing discrepancies involving 5-digit figures that have gone undiscovered for months or possibly years. The blame, however, cannot always be laid at the feet of service and equipment suppliers.

It is the user's reponsibility to keep track of his resources and those leased from outside firms. To minimize the chances of being caught in one of these financial and administrative tornados, users can turn to a new breed of software, known generically as telemanagement software.

"Telemanagement software will be the major issue of the second half of this decade," according to Richard Kaufman, a founder of the Society of Telecommunications Consultants and president of Richard N. Kaufman & Associates, Ltd., a Roxbury, Conn.-based consulting firm.

"Right now, users are fumbling in the dark when it comes to sorting out bills for equipment and services. One of my clients keeps a running total on a stack of these bills and doesn't pay them until they start to fall off the table," Kaufman said. "Every user has a pencil and paper approach to this problem, and none of them work.

"Another one of my clients has a staff trying to address this problem, and they are doing a lousy job," he continued. "Any user company that does more than a half a million dollars of business a year has to look at some type of telemanagement software."

Telemanagement software offers far more than simple call detail data. Typically, the packages will offer an inventory system, a work-order creation system, a billing system and the ability to update a company's telephone directory. Any one of these capabilities could lessen the amount of time or personnel needed to keep tabs on various aspects of telecommunications system management.

Neil Silberkleit, a consultant Kaufman called in to evaluate telemanagement software for two clients, said full-featured telemanagement software is in its nascent stage. Silberkleit compared a trio of software offerings, including NEC America, Inc.'s TCMS Astra package, software developed by Tympany & Co. of Garland, Texas, and a package offered by the New York-based Communications Consultants Group, Inc. (CGI).

Of the three packages, only one was fully developed, Silberkleit claimed. "I saw demonstrations of all three packages, and CGI's offering was the only one that was operational." NEC's TCMS Astra system is roughly 90% completed, he estimated.

Besides the fact that the product is available, the CGI offering came out on top in terms of ease of operation, Silberkleit said. "The entire system is menu-driven and is very easy to work with. NEC's system, which is largely menu-driven, is more complicated," he noted. "I had problems with simple operation of the NEC System."

Silberkleit said the CGI software can be used on everything from IBM Personal Computers and Personal Computer ATs to IBM 370 architecture mainframes. One drawback of the NEC software is that it only works on NEC's Astrafax system, a proprietary system. The Tympany software only operates on personal computers.

The inventory systems of the three software packages varied substantially, Silberkleit said. "The CGI software has a one-

See **Software** page 14

TELECOM TIDBITS

Tellabs, Inc. received a contract valued at $30 million to develop and manufacture a digital DS-3 cross-connect system for **Northern Telecom, Inc.** The 5-year contract is part of a technology exchange between the two communications equipment manufacturers.

The new system will be the first member of Northern Telecom's Digital Network Cross-Connect (DNX) family of products designed to connect telecommunications facilities that support transmission of 45M bit/sec.

☎

Dytel Corp., an Arlington Heights, Ill.-based call-processing systems maker, claimed it recently sold its 500th Automated Attendant Exchange. The call-processing system, which enables telecommunications managers to manage incoming telephone calls, is typically installed between incoming lines and a user's telephone system.

☎

NEC America, Inc. installed a Class 5 switch at a **Northwestern Bell** central office. The company claims it is the third vendor to install a Class 5 switch in a Bell operating company facility. The NEAX 61E Class 5 central office switch supports 2,304 lines and 240 trunks and employs a 32-bit processor.



SOMETHING BRILLIANT JUST HAPPENED TO DATA TRANSMISSION.

Introducing Public Data Network* from the Bell Atlantic Network Services Group. A startling communications development that's just made other interactive data transmission modes seem all but obsolete.

Packet Switching goes public.

Public Data Network offers the benefits of packet switching—through the telephone network—at speeds up to 9600 bps. By batching data into electronic "packets," Public Data Network is ideal for "bursty" applications like order entry, billing, information processing, credit approval, reservations, ticket sales and claims.

Suddenly, there's a more efficient way to move data.

Our Public Data Network is, without a doubt, the most efficient way to move interactive data. Period. What's more, rates are usage-based—dramatically lower than dedicated line costs.

Introducing automatic protocol conversion.

And because Public Data Network supports X.25 and asynchronous protocols, it's the perfect link between dissimilar data processing equipment. Like office and home computer terminals and multiple data bases. It also opens the door for electronic banking and electronic shopping and a long list of other interactive electronic subscription services.

A host of advanced network solutions.

In addition to Public Data Network, the Bell Atlantic Network Services Group provides an array of customized services to precisely match your communications needs.

From voice circuits to a variety of digital data services including High Capacity Digital Service and fiber-optic-based High Capacity Lightwave Service, we offer full duplex dedicated and switched digital data transmission at speeds ranging from 300 bps to 560 megabits. On a point-to-point or multi-point basis.

We're the customized network services experts.

Without optimized network transmission capabilities, your communications system is handicapped. That's where we come in. By applying our most valuable asset—our network expertise—we can unlock your system's potential, adding value through increased operating efficiency.

Contact your Account Executive, or call toll-free 1 800 843-2255, extension 14.

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RFP from **page 11**
caused more problems than it eliminated.

US West Information Services claimed the model was too specific.

Users planning to enter the RFP procedure in the future can learn much from the Seattle-US West Information Systems situation, regardless of whether or not the case comes to court.

The RFP process should not be treated lightly. The user would be well-advised to retain legal counsel before forming an RFP.

Legal counsel would be able to advise the user of possible consequences of specific RFP actions. Counsel would also be aware of the legal issues that should be addressed before the user begins the RFP process.

Users may also want to research cases where problems arose as the result of the RFP process to avoid problems other users have encountered.

Users planning to create an RFP may first want to discuss the topic with other users who have already completed the RFP process.

Legal counsel for users groups such as the International Communications Association and Telecommunications Association may be able to answer specific legal questions for their members.

"The user would be well-advised to retain legal counsel before forming an RFP."

Software from **page 11**
step program for inventory management, while the NEC system takes a layered approach to the same function," he explained.

"After reading the 20-page Tympany manual for an hour, I became frustrated. The other two vendors offer manuals over 200 pages in length."

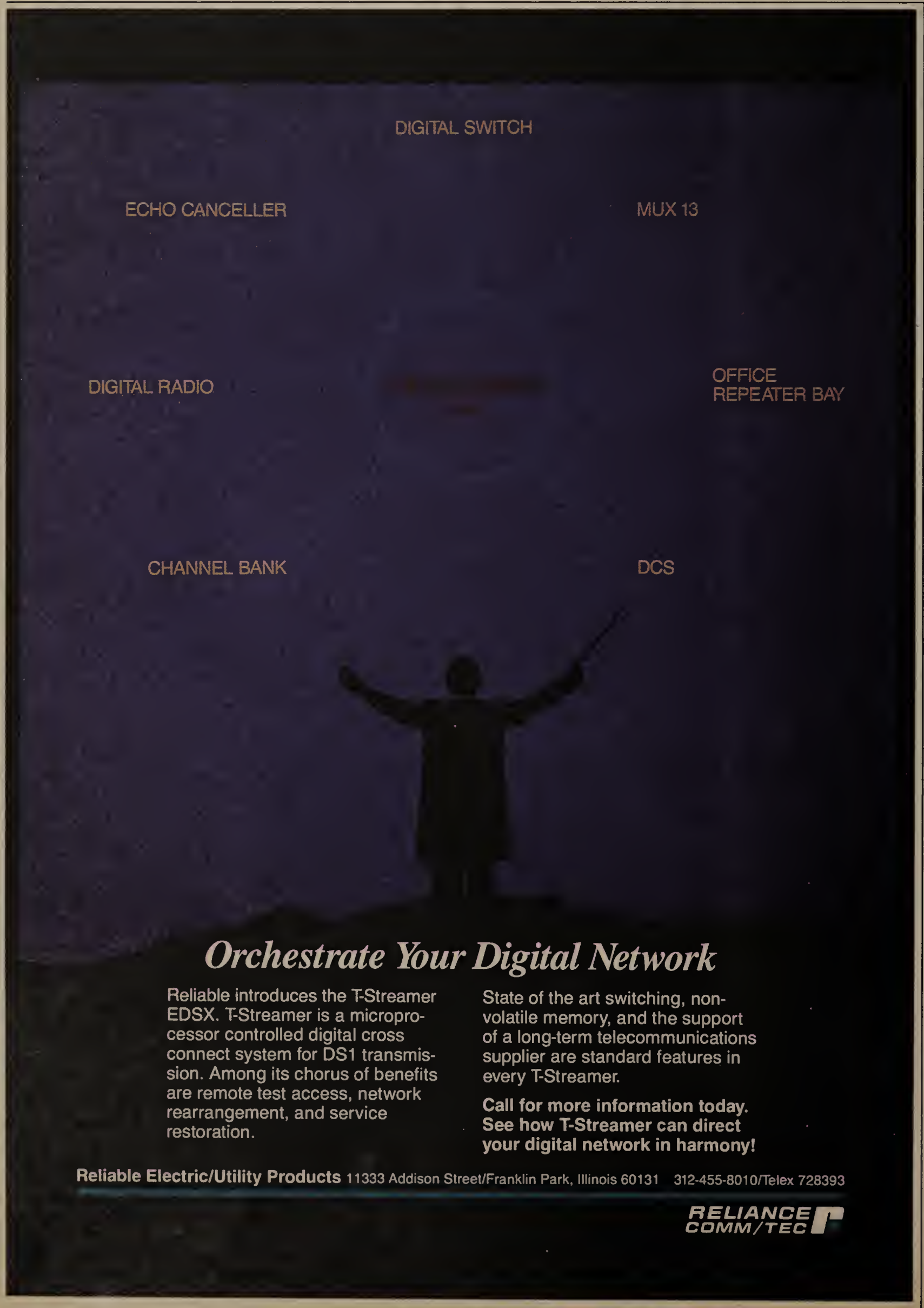
Kaufman said a strong inventory system is critical to telemanagement software. "If a user tells the telecommunications manager he wants a printer, the manager uses the software's work order system to create an on-line request," Kaufman said.

"The telecommunications manager checks the company's data base to see if the printer is available. If not, the manager checks the price of the printer, writes up an on-line purchase order and enters the delivery date of the device. Once installed, the printer is added to the company's inventory, and the cost of the unit is billed back to the department that requested the printer."

Silberkleit claimed CGI and NEC took different approaches to creating work order systems. "CGI's work order system was very straightforward, while NEC's was more complicated," Silberkleit explained.

Kaufman said a work order system that enables telecommunications managers to track work orders is also desperately needed. "The tracking of work orders has been a nightmare for years," Kaufman said. Telecommunications managers fill out the work orders but can't determine if the work is ever performed, he noted.

Kaufman called telemanagement software the equivalent of a consultant on a floppy disk, but maintained that the price is too high to attract medium and small users. Of the two packages that could work on systems larger than personal computers, prices ranged from $75,000 to $100,000. Both prices were for multinode systems, he noted.



DATA DELIVERY

Automated teller machine wars

BayBanks, Inc. filed an antitrust complaint in the U.S. District Court in Boston to prevent five banks from joining their automated teller machine (ATM) networks. Citing unfair methods of competition, BayBanks sued Connecticut Switch, Inc., the company designated to run the network, Bank of Boston Corp., Bank of New England Corp., Shawmut Bank of Boston, N.A., State Street Bank and Trust Co. and Fleet National Bank of Rhode Island. Currently, BayBanks operates 1,200 ATMs throughout New England. The cooperative network would link 1,800 machines by the end of 1987.

INTERVIEW

Cohesive chief talks


John A. McGuire

Sees merger with DCA as a strategic move.

T-1 multiplexer manufacturer Cohesive Network Corp. has been busy restructuring its sales and support staffs since its merger with Digital Communications Associates, Inc. last June. Network World *Senior Editor Paul Korzeniowski recently talked with John A. McGuire, Cohesive's president and chief executive officer, about the merger and the company's future.*

Why was Cohesive purchased by Digital Communications Associates?
We had just completed another round of financing and we had money in the bank, so it wasn't an economic issue. The reasons were strategic. We are in a systems business. Users are very concerned about a vendor's viability as well as product reliability.

When we finished developing our product, we started to move into areas of service and customer support. It takes an enormous investment to build that kind of organization. When DCA approached us, we had just started to examine our service strategy and question the financial power needed to stay in the business for the next five or six years. Also, we wanted to build up our marketing strength.

DCA had the items we were looking for. The company had marketing strength and an established direct sales and service force. We had leading-edge technology and needed marketing, financial strength and customer service. They had those items and needed leading-edge technology.

DCA had revenue of $143 million in June, has been growing at a rapid rate and anticipates revenue of more than $500 million in five years. Cohesive expects to supply a significant portion of that revenue.

Were other offers considered?
We were not considering a merger when DCA first talked with us. A number of other data communications companies had approached us but we had always said we were not interested in a merger.

How has Cohesive's sales and service team changed since the merger?
In 1986, we had eight direct salesmen and DCA had more than 40. We integrated the two sales forces so all salesmen are selling all of the prod-

See **Cohesive** page 16

NET/COMDESIGN

NET puts out new stat mux

REDWOOD CITY, Calif. — The first fruit of the fall merger between Network Equipment Technologies (NET) and ComDesign, Inc. resembles an apple with a bite taken out of it.

NET, a start-up company, manufactures a line of T-1 multiplexers called the IDNX. The company purchased ComDesign, which manufactures multiplexers and private branch exchanges, in August.

The fruit is the addition of a statistical multiplexer, the Mux/260, to NET's line. The product supports up to four channels, each operating at speeds of 19.2K bit/sec. On the link side, the device transmits data at speeds from 19.2K to 64K bit/sec. The Mux/260 supports local or remote connections and a maximum of 32 asynchronous devices.

NET has basically repackaged a current ComDesign product so that NET salesman can sell it to companies that have already purchased NET's T-1 multiplexers. NET plans to integrate the product so it can be controlled from an IDNX network management console. Prices for the Mux/260 range from $4,800 to $10,000.

DATA DIALOGUE

PAUL KORZENIOWSKI

Data dialogue ditties

As we close the books on 1986, let's examine trends that emerged during the last 12 months.

The local-area network craze. During the past 12 months, local-area networks moved from the elite to the masses. Nets tying 50, 100, 1,000 and even 10,000 users are up and running in small, medium and large companies. Revenue at leading local net vendors, such as 3Com Corp. and Novell, Inc., rose dramatically.

Equipment from a variety of vendors is being used on many networks. Sales of gateways and bridges are rapidly increasing as companies tie different locations and protocols together onto corporate-wide networks.

IBM attempted to get its local-area networking act together with the Token-Ring Network. With interfaces to front-end processors, controllers and the System/36s, IBM hopes that eventually the Token-Ring will be used to link the biggest local-area networks in the land.

The biggest problem that managers faced as they installed these large networks was a dearth of network management tools. During the year, IBM, Hewlett-Packard Co. and Excelan Corp. introduced products to manage and control local nets. Users experimented with the systems and awaited the day when network management could be done from a central console, which controls every item on the network.

Moving at the speed of light. In the past 12 months, T-1 marketing hype and hoopla traveled faster than a speeding bullet. New and established players tried to capture market attention by following one product introduction with another. Each introduction promised a revolutionary feature that would make telecommunications managers' lives much easier.

Teams of telecommunications workers were formed to knife through the marketing gristle to the meat of product features. Other projects were put on hold as large corporations allocated staff to T-1.

Fallout from the move was found in three areas. First, installations of T-1 networks increased dramatically, rising by as much as 40%, according to some analysts. Second, sales of other types of communications equipment were flat or decreased. In 1986, sales of low- to medium-end multiplexer vendors decreased as users spent most of their time looking at T-1 multiplexers.

Third, long-haul carriers suffered as large corporations increased network size while decreasing network costs. Because most carriers were expanding their networks, they needed additional long-haul revenue. They didn't get it.

Latent need for high speed. IBM's inability to supply its customers with long-distance, high-speed, channel-to-channel attachments left a market door open and a number of smaller companies, such as The Systems Center, Inc., Network Resource Corp. and Dataswitch Corp., walked in.

Large IBM accounts, such as Ford Motor Co., E.F. Hutton & Co. and The Travelers Insurance Co. called in other vendors to solve IBM's speed problems.

Big Blue does not seem ready to fill the void and has told customers that a more efficient T-1 interface and a T-3 interface will

See **Ditties** page 16

Cohesive from **page 15**
ucts. In our customer service department, we had 15 to 20 people. DCA had customer service offices in approximately 15 cities and 60 to 65 people in their service organization. Those two operations have also been combined.

Before the acquisition, Cohesive had a distribution agreement with General DataComm Industries, Inc. How did that agreement come about and why was it terminated?
In 1985, we attended a seminar and let it be known that we were looking for a partner that could service and sell our product. We seriously negotiated with several vendors before choosing General DataComm.

We were interested in using General DataComm's service organization to support our product and one never gets something for nothing. In return, they wanted to become the product's exclusive distributor.

We agreed that they could retain that distinction as long as they met certain sales quotas. When we began our discussions with DCA, the agreement was in effect. It did not make sense to have a distributor who is a serious competitor so all three companies negotiated to have the agreement terminated.

What sort of changes do you see in your product line?
We have a list of items that we plan to add in the next few years. One item is two-channel bundling. Users will be able to treat two channels as circuits and route them wherever they want.

Currently, users can only work with groups of 11 or more channels. That feature should be available next year. We intend to introduce a low-end multiplexer to the line and to be a Netview purveyor.

Is the market ready for T-3 44.8M bit/sec multiplexers?
We have customers who are currently working with T-3. It is emerging because a lot of fiber is being put into the ground. Companies are using railroad right-of-ways, and the BOCs have installed a lot of fiber.

For example, here in the Bay area, there is a large fiber network. Fortune 500 companies are already moving to T-3 now, and the demand will continue to grow. Eventually, vendors selling to large companies will need a T-3 multiplexer in their product line.

Are the user issues for T-3 different from T-1 concerns?
Most issues tend to be the same; T-3 is just a higher speed media. In general, T-3 is being treated and provided as 28 separate T-1 lines. There is a small maintenance problem because a user has to use a gateway to access a T-3 line.

Users would like to terminate directly into a product like our CN2. That would enable them to reach into and across a T-3 line and do troubleshooting at T-3 or T-1 levels.

What are customers looking for in network management?
Customers are gravitating to a hierarchical network management system, similar to the Open Systems Interconnect model. Some customers may want to use software on a mainframe to manage the network. Others may want to drive the network from a piece of communications equipment.

Vendors that want to remain in business will have to comply with, and be compatible with, other network equipment. There will be rungs on a network management ladder. We plan on being upward-, downward- and sideways-compatible with whatever network management tools are available.

What types of problems do users encounter when installing T-1 multiplexers?
For almost all of our customers, the network we installed was not the one planned for when we first talked to the customer. There are plenty of changes made to the network design, and the changes increase rather than slow down.

"Fortune 500 companies are moving to T-3, and the demand will continue to grow. Eventually, vendors selling to large companies will need a T-3 multiplexer in their product line."

Once the network is installed, a lot of applications come out of the closet and stimulate network growth.

How big was the T-1 market in 1985?
Market research firms estimated industry revenue between $145 million and $150 million, but the year has been slower than a lot of people anticipated. There are a number of reasons the market may be slowing down.

First, the proliferation of real and apparent products may give people more things to think about. Also, companies are not rushing to spend capital dollars because of the state of the economy.

On the positive side, companies are beginning to realize that they need a T-1 network from a strategic standpoint as well as from an economic side.

Companies see competitors spending a lot of money on telecommunications and want to keep pace. Insurance companies and banks are using telecommunications to win market share as T-1 becomes a strategic weapon.

Are only large companies implementing T-1 or has it become a technology for the masses?
Presently, some medium and small companies have installed T-1 networks. T-1 lines are becoming cheaper and more ubiquitous, and the prices of transmission media and T-1 multiplexers are coming down. Users who can't justify a T-1 network now will soon be able to afford one. The lower costs will drag in a larger and larger market. The cost recovery for some existing T-1 networks is very good — one year to two years — and networking T-1 multiplexers will be found in a number of other markets.

What will the market look like in the next two years?
I subscribe to the notion that history repeats itself and the PBX business may supply a good analogy to the T-1 market. At one time, the PBX market was controlled and there was no competition. Then, the government said, "Let's open the market up" and up sprung lots of PBX manufacturers.

Now, there are few big PBX vendors, a few small ones and not many others left. Some companies will not survive for whatever reasons, economic or technology. It is a natural phenomenon. That scenario could be played out in the next few years in the T-1 market.

Ditties from **page 15**
not be available for a few years. The inability to supply such equipment will continue to turn true Blue shops into multivendor users.

Acquisition fever. A number of large companies tried to round out their product line through acquisitions. Digital Communications Associates, Inc. added a high-end T-1 multiplexer to its product line by purchasing Cohesive Networks Corp. Network Equipment Technology, another T-1 supplier, purchased Comdesign, Inc., which manufactures low-end multiplexers and a line of private branch exchanges.

The price for some mergers was very high. Infotron Corp., which primarily manufactures multiplexers, purchased Applitek Corp., a wide-area network vendor, and promptly announced a significant loss in the next quarter.

OSI gains ground. Support for the International Standards Organization's Open Systems Interconnect network model swelled for two reasons.

The Manufacturing Automation Protocol/Technical and Office Protocol users group continued to gain membership and influence. The organization has become the dominant voice for bringing users' data communications issues to the attention of various suppliers.

Also, the formation of the Corporation for Open Systems (COS) soothed the fears of users concerned that various OSI products would not work together. COS membership swelled to more than 70, and a war chest was set up for the funds needed to establish an OSI conformance laboratory.

Despite the groundswell of support, few high-level OSI products were unveiled. An exception was X.400, an OSI standard for exchanging electronic mail messages. Digital Equipment Corp. was the first vendor to announce an X.400, and a few small vendors with eyes focused on the OEM market followed suit.

High speed moves to the low end. A healthy market emerged for high-speed, dial-up modems. A number of vendors announced products that complied with the CCITT's trellis-coded modulation standards and transmitted data at speeds up to 19.2K bit/sec.

Demand for the products surprised some vendors whose shipments could not keep pace with orders. Users reported that the devices worked well and helped dramatically cut their companies' dial-up line costs.

Moving off the back burner. Competition in the front-end processor market, which many analysts consider very mature, increased dramatically. In May, NCR Comten, Inc. announced a high-end device that dwarfed the IBM 3275 in power and capabilities. Big Blue responded with a new release of VTAM and its first remote front-end processor. New players, such as Control Data Corp. and Sperry Corp., threw their hats into the ring. Just proves that one can teach an old dog new tricks.

DISOSS disciples increase. Despite the clamoring about the product's limitations, IBM's DISOSS gained followers as almost every office automation vendor announced support for the product.

Data General Corp. unveiled the most ambitious link, a product that transforms a DG Eclipse superminicomputer into a Physical Unit 2.1 device capable of establishing a peer-to-peer session with an IBM host.

Burroughs Corp., Wang Laboratories, Inc. and Hewlett-Packard Co. all unveiled initial links to DISOSS. The fact that so many vendors have jumped on the DISOSS bandwagon clearly illustrates the might of IBM's marketing power. DISOSS has been criticized as a user-hostile product that eats up a great deal of mainframe processing cycles. If anyone other than IBM had introduced the product, it probably would have died a quick, painful death.

A constant reminder. Year after year, one annoying item remains constant. Vendors' announce products consisting more of window dressing than finished products. This practice creates a number of problems for communications managers faced with multimillion dollar career-make-or-break purchase decisions. If Santa could grant these managers one wish, it would be an end to this practice. Here's hoping that their wish does come true.

LOCAL NETWORKING

"Better and easier connectivity is needed between PCs and minicomputers. Without it, the Novells and 3Coms of the world will eat the market out from under the mini guys.

John McCarthy
Research manager
Forrester Research
Cambridge, Mass.

▶ FAULT TOLERANCE

Network integrity: a growing concern

BY PAULA MUSICH
Senior Editor

Novell, Inc. began shipping Level II of its System Fault Tolerant (SFT) Netware last week, marking a commitment to reliability the company said is necessitated by the increasing amount of data entrusted to network file servers.

Less convinced that the need for "fault tolerance" applies to all network users, Phoenix Technology, Inc. founder Joseph Kennedy maintained that only specialized niche applications require the level of reliability provided by fault tolerant networking. His firm, which will soon be acquired by Bridge Communications, Inc., specializes in "high availability" networking components.

Both firms, although they address different segments of the local networking market, provide products designed to protect data integrity and maintain availability in the event of network failure. Novell concentrates on the file server, while Santa

See **SFT** page 18

▶ INTERCONNECTIVITY

Apple to polish network gear

Cluster of access products expected in early '87.

BY MARY PETROSKY
West Coast Correspondent

CUPERTINO, Calif. — Although Apple Computer, Inc.'s network product efforts have gone largely unnoticed, the company has publicly committed to bettering the communications abilities of its micros, and a slew of product introductions are rumored to be slatted for first quarter 1987.

Apple is said to be readying, among other things, an "open" version of the Macintosh; that is, a version designed to accept accessory boards such as IBM 3270 emulation cards. Apple executives declined to discuss the open Macintosh, but the machine is likely to enable users to connect processors to other networks and host computers.

Third-party vendors have rushed to fill the gap for servers, bridges and gateways left open by Apple, but users are still ask-

See **AppleTalk** page 18

LANMARKS

PAULA MUSICH

LAN Shootout ricochets

The escalating battle of performance benchmarks for personal computer local networks has peaked, hopefully, with Novell, Inc.'s "LAN Shootout." The recent media event was more hype than substance. Rather than providing credible, conclusive results, it showed the intense competition between Novell and 3Com Corp.

In this rivalry, both vendors are jockeying for position in the buyer's mind. At stake for Novell is its established position as *the* high performance network operating system vendor. 3Com challenged that position in a series of print advertisements published in this and other publications.

The series attempted to focus the market's attention on 3+, 3Com's late-blooming network operating system.

But observers hoping to get an idea of how the two vendors' products would perform in their given networking environments came away from the Novell Shootout more bewildered than educated.

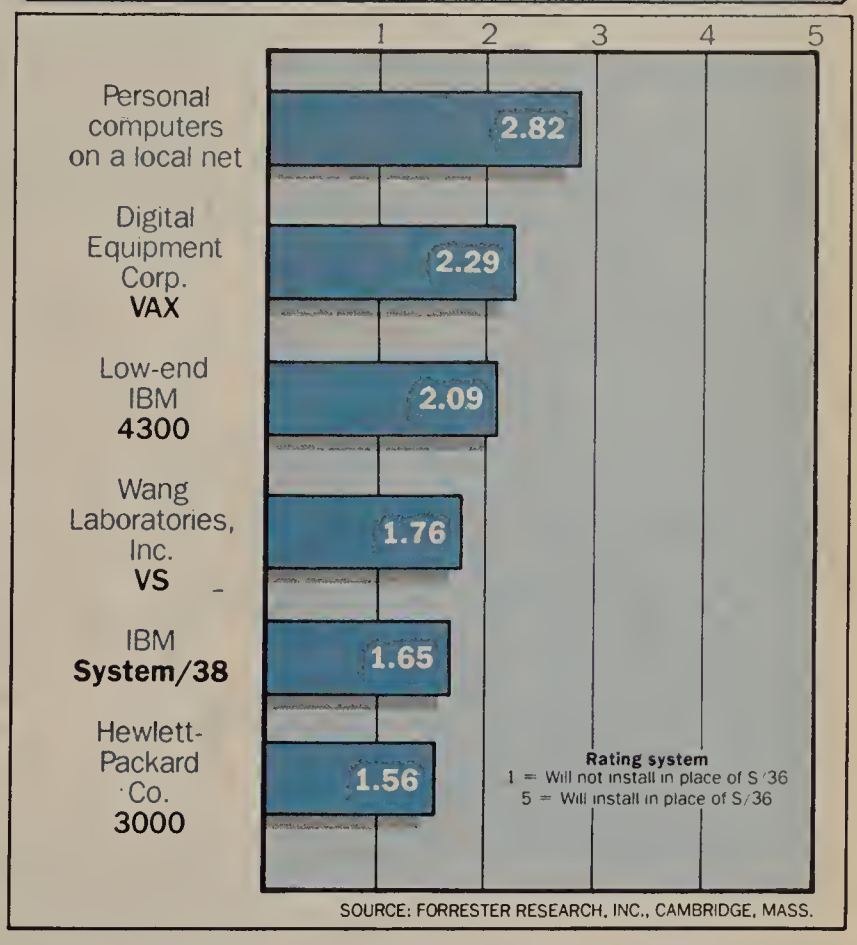
Contributing to the confusion was Novell's presentation of two different sets of conclusions, those of Innovative Software and The Seybold Group, Inc. Each came to a slightly different conclusion, making observers wonder whose test was more definitive.

The search for excellence in personal computer networks will continue to elude vendors and users until independent testing organizations develop and perform their own benchmarks without being paid by vendors.

The Seybold Group's credibility was questioned because they were paid by Novell, even though they are a well-respected testing organization and

See **Benchmark** page 18

Top-rated alternatives to IBM System/36



SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

▶ SYSTEM SURVEY

PC LANs offer best S/36 alternative

BY PAULA MUSICH
Senior Editor

Fortune 1,000 companies looking for substitutes for IBM's System/36 departmental minicomputers rated networked personal computers as a top alternative, according to the results of a recent study.

The survey, conducted by Forrester Research, a Cambridge, Mass.-based research firm, questioned 35 users who had used or evaluated the System/36 as a departmental computing system.

It found that the failure of IBM and other minicomputer vendors to "provide comprehensive PC connectivity solutions has led users to implement PC local-area networks," according to Research Manager John McCarthy.

Among the respondents who evaluated but did not implement a System/36, 73% said that the System/36 was "unworkable as a PC integrator." Among the System/36 users, 50% said the System/36 was "not a perfect solution," but they would add personal computer integration as a secondary application. "When the main application of the system is PC integration, the S/36 does not meet users' expectations," Forrester concluded.

"Simple minicomputer terminal emulation is not an integration solution for users. It should be peer-to-peer. The vendors should make it simpler for PCs to take information out of minicomputer-based data bases. You can't get a quick extract on the departmental data base and drop it into a Lotus spreadsheet," McCarthy said.

Most non-System/36 users also complained about the device's lack of personal computer support capabilities, and they rated IBM's PC Support/36 software the lowest among System/36 programs.

The same group also gave a low rating to the IBM System/36 data base program, Data Utilities/Query/36. Since

See **Study** page 18

SFT from **page 17**

Clara, Calif.-based Phoenix builds redundancy into communications servers, network media and data link components.

Central to the debate over the need for fault tolerance is cost. A Novell spokesman said, "It would be difficult to put a price tag on the shared data in today's [local networking] environment." However, implementing full redundancy in a network can double its cost — an expense that casual network users cannot justify.

To make the cost of fault tolerance more palatable, Novell created three stages of its SFT line — Level III is due out in 1987 — each of which increases in cost and degree of protection. Level I is bundled with Novell 286A and 286B servers. As a separate software package, SFT Netware Level I is priced at $2,995.

Level I automatically creates duplicate file-allocation tables, provides a backup in case of failure in the directory area of the disk and performs read-after-write verification after each disk write.

Novell will upgrade every server it has shipped since March or April of this year with Level II, according to Craig Burton, Novell's vice-president of corporate marketing. Separately, the software is $3,995.

Level II adds the ability to "mirror disks," or automatically write to duplicate disk drives. An optional Transaction Tracking System protects network data base integrity by ensuring that network hardware failures do not corrupt or destroy partially updated portions of data. It is priced at $995.

Users can selectively implement fault tolerance within a network using both firms' products. "There are a lot of different levels of fault tolerance. You pick a balance in price and performance depending on your requirements," Kennedy said. "For example, implementing it in the backbone of a large, corporate network might be easily justified if critical operations are run on the network."

The additional cost for this level of protection would reach 50% to 60% of the cost of the network. Fault tolerance can also be limited to specific segments of a net where critical resources are located.

The specific niche addressed by Phoenix, where users are typically willing to pay a 100% penalty for fault tolerance, includes the government and defense contractors who install command and control systems. Phoenix products are installed on "any kind of network that has an operational-ready requirement," Kennedy said.

In the commercial sector, Phoenix targets users running on-line transaction processing systems and process control systems for manufacturing environments. Demand in these areas is growing due to increasing use of local networks. Fault tolerance for these applications was previously provided by redundant point-to-point links.

Kennedy also sees demand for fault tolerance growing in commercial applications. "The availability of resources will become more critical as a larger percentage of corporate resources are added to the network." The network in this scenario would provide many users with access to the corporate data base, the applications required by a variety of departments and large "compute resources."

> *"Putting full redundancy in a network can double its cost — an expense that casual network users cannot justify."*

One such network is installed in Southern California Edison's San Onofre nuclear power plant. Network Engineer Bill Lawrence plans to install Novell's Level II SFT on this network, which links 600 users and supports 1,300M bytes of online, active storage.

Lawrence anticipates the added benefit of automatic backups with Level II's disk-mirroring capability, but feels the price to be paid will be in increased overhead and decreased performance. "If critical and continuously changing data is being put on the network, it's worth the price, unless someone has more time than money."

Burton believes other personal computer networking vendors are planning to add fault tolerance to their offerings and users will demand greater reliability. "We said file server software will be a requirement, while the rest of the industry said disk servers were adequate. Now it is a requirement. We think system fault tolerance will become a requirement in the next 18 months."

Study from **page 17**

one of the primary functions of a minicomputer as a personal computer integrator is to run multiuser data base applications, this does not bode well for the System/36, according to the study.

Most minicomputer vendors have not implemented connectivity at the application level, which would provide access to mini-based data bases.

"They haven't addressed questions such as, 'How do I deal with different data formats?'" McCarthy said.

The report was released in a recent Professional Automation Report, a Forrester monthly report priced at $450.

Benchmark from **page 17**

swore that no one knew the results of their testing before the event occurred.

Burden falls on net buyers

Of course, it is unreasonable to expect a testing organization to incur the expense of developing performance measurements alone, so the burden would have to fall on network buyers. Then it becomes a question of just how important is network operating system speed and/or hardware performance.

Performance is, after all, only one factor out of many that prospective buyers need to consider before they decide on which network, if any network at all, suits their needs best.

One more lesson can be learned from the benchmark performance wars. Prospective buyers still have to do their homework. The type of shortcuts offered under the umbrella of performance benchmarks are as useful as Cliff Notes: They provide some answers in the short term, but fall short on content in the long run.

Determine exact needs

To implement a network successfully, users still have to determine exactly what needs they expect a local network to serve, how the network will be used and what types of applications they will run.

Only then can performance measurements be factored into the final decision.

AppleTalk from **page 17**

ing Apple to offer its own products.

The company has responded, in part, with a promise to deliver an interface card that will enable MS-DOS-based IBM Personal Computers to tie into the AppleTalk network. Such cards are already offered by Tangent Technologies of Norcross, Ga., and Centram Systems West, Inc. of Berkeley, Calif.

Although disk and file servers are also available from third parties, including 3Com Corp., many users are waiting for Apple to make good on a promise to provide its own file server.

At the introduction of the AppleTalk network in January 1985, Apple said it would announce a server before year end. Two years later, users are still waiting, but several sources have said that Apple now has server software dubbed AppleShare up and running on a Macintosh.

Apple managers wouldn't comment on the existence of such software. However, Gursharan Sidhu, manager of Network Systems Development, did acknowledge that the company would soon launch a product "to enhance people's ability to share things on the network."

Despite communications shortcomings, Apple has realized some success with its AppleTalk network scheme. At last count, Apple had shipped more than 250,000 connector kits, nonintelligent wiring devices used to interconnect AppleTalk nodes.

The $50 connectors are all that is required with AppleTalk because the network interfaces are built into Macintosh personal computers and LaserWriter printers.

Unlike personal computer network systems offered by vendors such as Novell, Inc. and 3Com, AppleTalk is a distributed intelligent system, capable of discovering a user's identity on the fly, Sidhu said. This feature enables AppleTalk to reconfigure itself dynamically as devices are added or taken off the network. AppleTalk operates at 230K bit/sec and uses the carrier-sense multiple access with collision avoidance access method.

"There is a misconception that AppleTalk is basically a cabling scheme," Sidhu said. "That is a very small portion; AppleTalk is a full-fledged architecture consisting of many layers of protocols." Apple has expanded the protocols since they were first introduced and will continue to enhance them, he said.

"We can replace the Apple cabling scheme with any other cabling scheme. You can yank out the data link layer and replace it with another one," Sidhu continued. "The philosophy in AppleTalk is to have a very open architecture, which means you can access any protocol in the stack."

Apple publishes its protocols as part of its open architecture approach, enabling third-party vendors to develop products more easily.

Several vendors are currently offering or have announced alternate cabling for AppleTalk. Last June, Farallon Computing of Berkeley, Calif., introduced AppleTalk connectors designed for use with existing telephone wiring, rather than the shielded cabling Apple offers.

Farallon calls its system PhoneNet, which allows users to configure AppleTalk networks in a star, tree or daisy-chain topology, compared with the daisy-chain arrangement Apple's cabling allows.

Apple is also working with third-party developers to implement AppleTalk as an architecture on Ethernet cabling schemes, said Peter Friedman, Apple's desktop communications marketing manager.

"We intend to support things that have become major standards," he said. In addition, Apple plans to implement AppleTalk over IBM's Token-Ring system. It also intends to support the Network Basic I/O System and LU 6.2 protocols, either directly or through third parties, Friedman said.

"The other thing we think is important is the PBX arena, and we're working closely with Northern Telecom on a number of projects," Friedman added.

"We will also be doing more with Macintosh-to-MS-DOS connectivity." In addition, Apple will concentrate on mainframe and minicomputer connections. It will also provide links to information services such as MCI Mail and Dow Jones News Retrieval Service.

In an attempt to attract corporate users, Apple is focusing on the Macintosh's network user interface, stressing the ease of use and training this interface affords.

THE RESPONSE HAS BEEN DEAFENING.



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CLEAR ACROSS AMERICA.

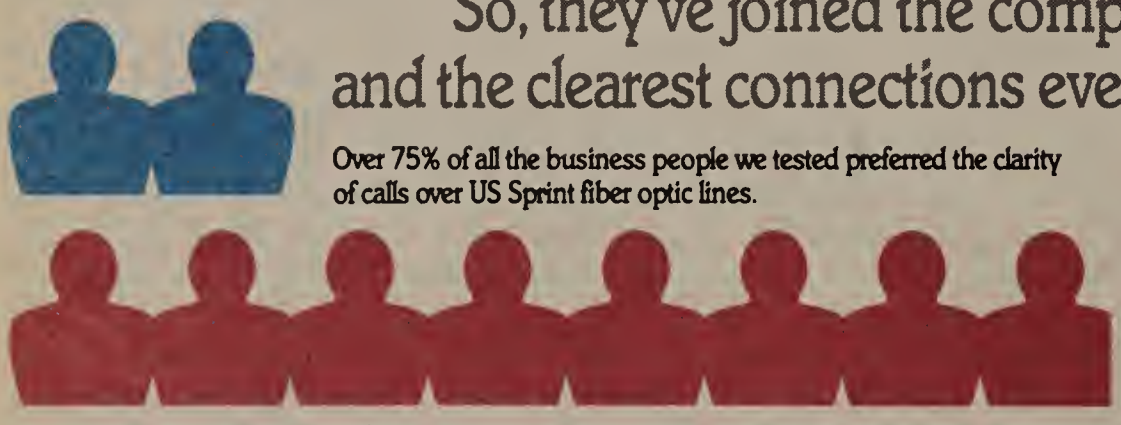
In the last five months more than 2,000,000 new customers have come to US Sprint,™ for two good reasons.



First, US Sprint offers the best overall savings in long distance.* Right this minute.

Second, US Sprint is the only company anywhere that's building a coast-to-coast 100% fiber optic long distance network.

So, they've joined the company committed to building fiber optics and the clearest connections ever. Connections so clear over 75% of all the business people we tested preferred the clarity of calls over US Sprint fiber optic lines. And they preferred them over calls made on AT&T lines.

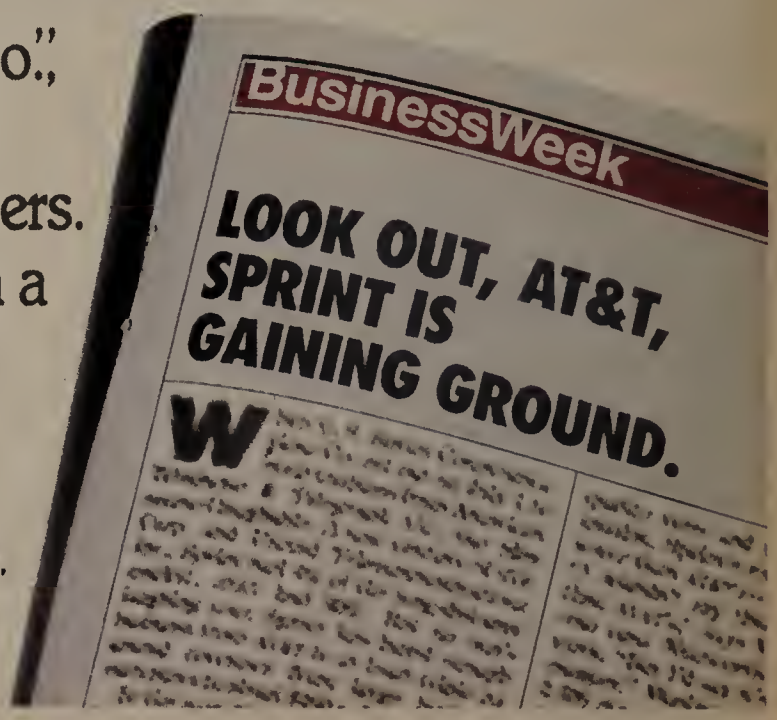


Over 75% of all the business people we tested preferred the clarity of calls over US Sprint fiber optic lines.

There's other impressive news, too. As stated in BUSINESS WEEK* on December 1, 1986, companies like "Sears, Roebuck & Co.," "Honeywell," "Unisys Corp. (Sperry-Burroughs)," "F.W. Woolworth," and "Singer" are now US Sprint customers.

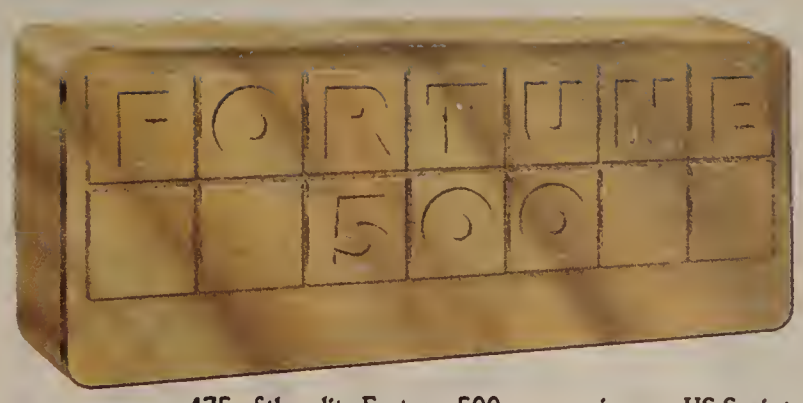
These are companies that don't make decisions on a whim.

They demand the excellent quality at the lowest price. And they chose us.



BUSINESS WEEK, December 1, 1986, page 122, well worth reading.

*This is not an endorsement from Business Week.



475 of the elite Fortune 500 companies use US Sprint.

In fact, US Sprint now provides long distance services to 475 of the FORTUNE 500.

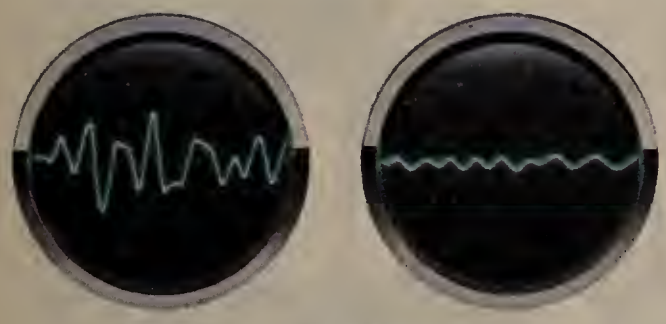
That's up from 416 in May.

As you're reading this, US Sprint is changing the way your long distance will sound and the way your data will travel across the country. We're building the only, coast-to-coast, border-to-border, 100% fiber optic long distance network.

All new. All fiber optic.

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AT&T has to mix fiber optics with older technologies like microwave or copper cable that they have used for so long.



The oscilloscope on the left illustrates the background noise on a typical AT&T connection. On the right, the background noise of a US Sprint fiber optic connection. And that's what all the shouting's about.

US Sprint fiber optics is so clear and noise-free, that half of all the people we tested on a US Sprint fiber optic long distance connection actually thought it sounded closer than a local call.

But it wasn't.

We don't cheat.

And, of the 77% of the business people who preferred the fiber optic calls over US Sprint lines, 9 out of 10 said they'd switch.

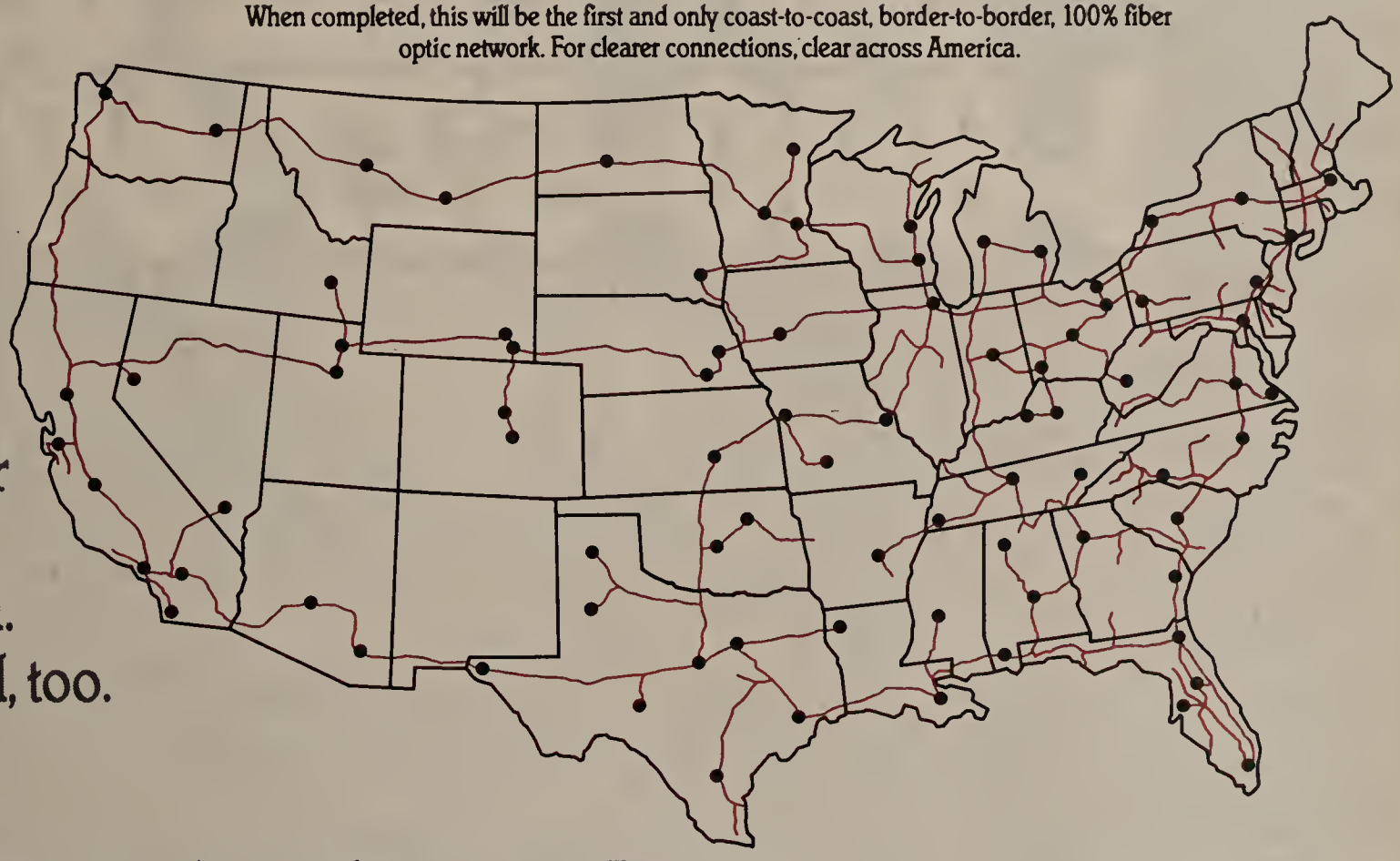
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COMMUNICATIONS MANAGER

"If the customer can enter a data base which controls the use or assignment of digital facilities from a terminal, we never have to handle reconfiguration service orders or do the engineering work. Our costs go down. The more cost-effective it becomes, the more likely the customer is to use communications to solve a business problem.

V. Larry Schwenk
Division manager
Service and application marketing/competitive assessment
AT&T

▶ TELECOM TRAINING

How to prepare pros?

Speakers argue merits of technology vs. broader courses.

BY NADINE WANDZILAK
Staff Writer

DENVER — Exactly what students should learn in school to prepare them for jobs in telecommunications is a matter of dispute, according to speakers at a tri-university seminar here last month.

Three universities — Columbia University, the University of Pittsburgh and the University of Colorado — brought university, industry and government specialists together to discuss how to improve telecommunications education programs.

While several speakers recommended that the training for a telecommunications specialist be broadened to include management and legal issues, others suggested programs delve more deeply into telecommunications technology.

Among the speakers who supported a broadening of the telecommunications curriculum was James Weinstein, education manager for the International Communications Association (ICA). "From the end-user side, we're telling students that they need to be able to manage people and time as well as technology," he said. "Schools are starting to recognize that they can't just crank out a product — a student — that can run a switch."

Some universities are aware of the need for that kind of "eclectic" approach to education, according to Weinstein. One problem, he said, is the constraint of being able to pack only so many requirements into a degree program.

Michael Botein, codirector of the Center for Telecommunications and Information Studies at Columbia University in New York, recommended that legal and regulatory principles be included in telecommunications course work. "If I'm faced with designing something that has, as it almost invariably does today, a legal or regulatory ramification, maybe the most elegant design is not the best solution because of various regulatory situations," he said.

"With deregulation, the easy answers to regulatory issues that we had are largely disappearing," Botein said. "So you simultaneously have much greater activity and much less certainty as to what the regulatory answer is." Legal and regulatory principles can be covered easily in a two- or three-credit course, he said. Students at the conference said they were interested in such a course, he added.

But another speaker pleaded for more technical depth in the telecommunications curriculum. Bud Wonsiewicz, vice-president of science and technology for US West Advanced Technologies in Denver, said, "There's a market for graduates who have technical depth, who understand underlying principles well enough so they will not become obsolete as technology moves on. We ought to be educating people by providing them with ways of thinking about problems and tools for analyzing, rather than a familiarity with current vendor catalogs."

Today's curriculum is diffuse, Wonsiewicz said. "The curriculum consists of courses in marketing, regulatory [issues] and a couple of courses in available technology. But I'm concerned that we're generating people who only understand the current buzzwords."

To counter that concern, Wonsiewicz suggested that, at the master's degree level, telecommunications degrees be more specialized, such as a master's in telecommunications in marketing or engineering. The specialization would make the degree worth more, he said.

Wonsiewicz moderated a panel on educational requirements for telecommunications students. The panelists were of several minds, he said. The vendor on the panel said telecommunications graduates lack depth in research and development and manufacturing skills, eliminating these students as primary candidates for jobs with vendors. The user and network supplier both support a broad curriculum, according to Wonsiewicz.

Each university must decide for itself what its course mix will be, summarized George Morgenthaler, director of the Interdisciplinary Telecommunications Program at the University of Colorado in Boulder. He emphasized two points made during the conference. Today, telecommunications and telecommunications professionals are viewed as a strategic corporate asset, not just a service or utility, he said. In addition, there is a need today for other than strictly technical research, in network operations analysis, for example.

To find out what education programs are available in telecommunications, the ICA had a survey done about a year and a half ago. The responses from 46 universities are available in a 350-page telecommunications education guide from ICA for $25.

DIALOGUE

Have you implemented micro-to-mainframe links or gateways from local networks to larger systems?

"I have approval and funding to buy and install a local-area network with a mainframe gateway by the end of March. It's much easier planning for both at the same time. In my opinion, a local-area network is only half complete without a tie to the mainframe. But not everyone has the need for a mainframe gateway. Between 25 and 30 people will use one or maybe two local-area networks here for one of two main departmental responsibilities, financial, and finances and taxes.

William Hays
Technical advisor
Decision Support Systems
McDermott, Inc.
Alliance, Ohio

"I'm on a departmental local-area network with a gateway that allows all the personal computers on the network to look like IBM 3270 terminals to our IBM 3090 mainframe. I access the mainframe largely to check out the status of our on-line CICS TSO network. I also have access to the corporate budgeting system on the mainframe.

This is the first pilot local-area network in the corporate complex. It's been running for about six months. From the start, the intent was to add the gateway to the network. We're using an IBM Personal Computer AT as the gateway to IBM's Systems Network Architecture. We've got a pretty firm equipment standard — all the PCs on this network are IBM XTs. The net connects 14 users, primarily for word processing.

Since we put up this network we've also put up a Token-Ring Network to support an executive, graphic data base display where executives can call up trend data in graphic format. The intent is also to gateway that network to the mainframe.

Donald Higgins
Director of computer services
Florida Power Corp.
St. Petersburg, Fla.

"We are at the germination point for several departmental local-area networks with mainframe links. Whether the gateways will come at the same time as the local nets, we're not sure. The availability of gateways makes the installation of local-area networks more attractive now.

The demand to network is coming from departments that, for the most part, have had a taste of personal computer use. They've tasted the entree. Now they want the full meal.

In some cases they are requesting mainframe links. But that doesn't mean they're knowledgeable enough to know that what they're requesting is a local-area network with a gateway. Our mainframe applications could include analysis of medical records or work orders by our facilities and planning departments. Those orders are now stored on the mainframe but no sophisticated analysis is done on them beyond printed reports. Ultimately a gateway could provide access to a hospital-based clinical data base.

Leonard Steinback
Information Center manager
Health Science Center
State University of New York
Brooklyn, N.Y.

"We don't have any local networks yet, but I'm looking for a mainframe-to-personal computer link. We have between 1,500 and 2,000 personal computers that are basically used for spreadsheets. One application that brought the micro-to-mainframe link issue to a head was people taking mainframe printouts and rekeying the information into their personal computers. Users are finally saying, 'If I could get to this data, we could do more with it, such as analysis.'

George Oakley
Assistant vice-president
Security Pacific Automation Co.
Glendale, Calif.



Chuck Boucher, President, General Technology Inc.

"My customers—largely Fortune 500 companies—read *Network World.* Consequently, that's where I want to advertise."

Chuck Boucher is president of General Technology Inc., a company based in Melbourne, Florida. They manufacture Balun concentrators and station units, devices which eliminate the need for expensive coaxial cable—and they design and install network control/management systems.

"My customers—largely Fortune 500 companies—read *Network World.* Consequently, that's where I want to advertise," says Chuck. "When I asked them why they read it, they said that *Network World* is the only publication written for users—an idea that they felt was long overdue. They said that *Network World* gives them the best coverage of network control and management, LANs, communications software and T carriers—all areas of interest to General Technology and our customers," he explains.

General Technology Inc. began advertising in *Network World* in September. "The ad—black-and-white measuring 2 columns by 10 inches—ran once, and the response was overwhelming. There were countless requests for product literature and demos—plus 30 solid sales leads. We even had to pull the ad for two weeks to get caught up," says Chuck. "But we're running again," he adds, "because, based on all the responses, we know *Network World* is talking to the right people."

Each week, over 60,000 purchase-involved subscribers look to *Network World* for decision-making information that can help them—and their companies—stay ahead. And more companies, like General Technology Inc., are finding there's no better place to reach a powerful audience of communications buyers. To join the ever-expanding list of *Network World* advertisers, call your local *Network World* sales office and reserve space for your ad today.

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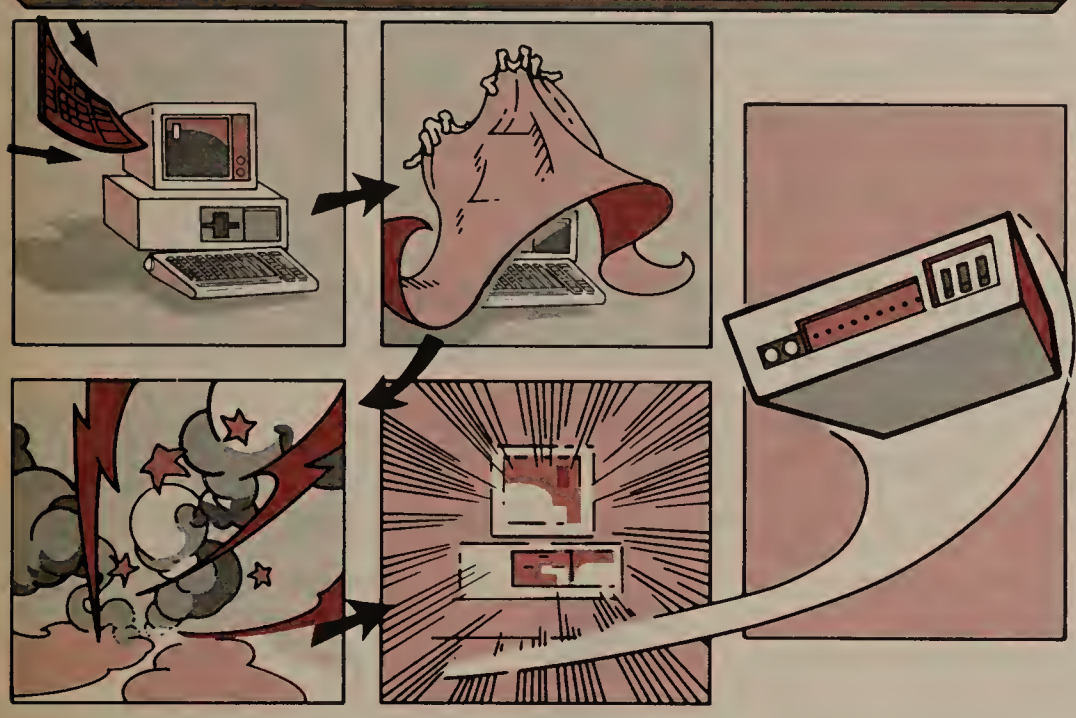
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NEW PRODUCTS AND SERVICES

Coming in the Jan. 5 issue:
▶Comparative review of mini-DACS systems

Add-on board turns personal computer into AT&T Dataphone Digital Service unit



▶DIGITAL DATA DEVELOPMENT

Add-on board provides PCs with DDS support

CARROLLTON, Texas — An add-on board that turns a personal computer into a channel service unit/data service unit (CSU/DSU) capable of working with AT&T's Dataphone Digital Service (DDS) was unveiled by DSP Technology Corp.

The Speedlinx 56 board plugs into an IBM Personal Computer AT expansion slot and provides a DDS interface that operates in full-duplex mode and supports digital communications at speeds up to 56K bit/sec. The Speedlinx interface reportedly complies with AT&T Publication 62310 for four-wire digital data systems.

With the board, an IBM Personal Computer AT will be able to access and transmit data over either the 56K bit/sec Accunet or Accunet Switched 56 digital data transmission services offered by AT&T, according to DSP.

The board's primary use is for high-speed file transfer with host systems or other personal computers. The Speedlinx 56 comes with a software package supporting basic file transfers. Also included is a programmer's guide, which allows users to develop other interactive applications for an IBM Personal Computer.

The board also features a suite of diagnostic capabilities including loop-back tests for the interface with the DDS network and self-diagnostics. The host personal computer is also able to activate local and remote loop-back tests across the complete link.

A company spokesman said the device can support videoconferencing applications or act as a gateway to local-area networks.

He also said the Speedlinx 56 offering does not take advantage of the secondary channel that many telephone companies have begun to offer with DDS-type services. The secondary channel is designed to carry CSU/DSU diagnostic information over a separate channel within the digital data transmission offering.

Initial shipments are scheduled for the first half of 1987. The Speedlinx 56 costs $1,495.

▶PROTOCOL CONVERTER

Comten offers asynch board

Converter gives asynchronous links.

BY JIM BROWN
New Products Editor

ST. PAUL, Minn. — NCR Comten, Inc. unveiled a protocol converter that enables its Comten 5620 communications processor to work with asynchronous devices.

The Integrated Protocol Converter (IPC) allows up to 32 asynchronous devices to access one of two hosts attached to the Comten 5620. The hosts can be in an IBM Systems Network Architecture or a non-IBM, non-SNA environment.

An IPC comes with either eight, 16, 24 or 32 RS-232 ports and plugs into the Comten 5620. The product converts asynchronous protocols to Binary Synchronous Communications (BSC) protocols so that attached asynchronous devices can access IBM SNA host applications by emulating an IBM 3278 terminal.

The IPC interacts with Comten's 5620-resident software to provide terminal emulation and 3270 BSC cluster controller emulation capabilities. A 32-line device can be configured to allow up to 12 attached asynchronous devices to switch between protocol conversion mode and native pass-through mode.

The IPC automatically detects baud rates of incoming signals and supports line speeds up to 9.6K bit/sec.

The product also features password protection for users attempting to sign onto a port, as well as a queue flush function that controls access to IBM IMS data base files. The device can be configured on a port-by-port basis to log off a user automatically after up to 60 minutes of inactivity.

The IPC recognizes up to 43 different asynchronous terminal types as well as up to three user-defined custom terminal types. During logon procedures, the user is asked to declare which of the terminals is in use. The IPC will then use internal translation tables to create the set-up parameters for that type of terminal. The IPC will also provide asynchronous users with menus and display screens typically associated with IBM 3270 display stations.

According to the firm, a standalone 5620 supports 32 communications lines. Addition of the IPC pushes that number to 48. Those 48 lines consist of 32 asynchronous devices attached to the IPC as well as 16 other communications lines, each of which are capable of supporting cluster controller devices using BSC, Synchronous Data Link Control or X.25 communications protocols.

An 8-line IPC is priced at $6,780, and the 16-line version costs $9,000. The 24-line version lists for $12,070, and the 32-line version costs $14,290.

Products & Services

Limited-distance modems, modem eliminators out

Connecticut Technical Corp. (CTC) unveiled four modems and four modem eliminators.

Operating in half- or full-duplex, the modems support asynchronous communications and either RS-232 or V.35 interfaces. Both the **Model LDM232 and LDM232-1** support RS-232 interfaces and transmit at up to 38.4K bit/sec. The **LDMV35** and the **LDMV35-1** transmit at up to 57.6K bit/sec using a V.35 interface. Designed for point-to-point and multidrop polled network applications over distances of eight to 10 miles, the modems include digital and analog loop-back testing and an optional antistreaming feature.

The **ME422, ME422-1, ME232** and **ME232-1** modem eliminators support local synchronous or asynchronous bidirectional communications over a maximum of 4,000 feet. The ME422 and ME422-1 support transmission between RS-422 devices at up to 921.6K bit/sec. The ME232 and ME232-1 allow communications between RS-232 devices at speeds up to 57.6K bit/sec. The ME422-1 and ME232-1 do not provide monitoring and front-panel clock mode selection.

The LDM232 is priced from $200, while LDM232-1 prices start at $125. The LDMV35 is priced from $225, and the LDMV35-1 starts at $150. The ME422 prices starts at $550, while the ME422-1 start at $450. The ME232 is priced from $350, and the ME232-1 starts at $250.

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T-1 Open Systems Integration (OSI)—A Technical and Strategic Review

Leader: Harold C. Folts, Executive Director, OMNICOM Inc.

Enroll in this intensive one-day tutorial for a thorough understanding of the concepts and terminology of OSI, a working knowledge of the OSI architecture, an introduction to the seven layers of OSI protocols, and expert guidance in applying OSI to the evolution of distributed information systems. *Level:* Intermediate.



T-2 ISDN—Status and Developments

Leaders: James G. Herman, Director, and Mary A. Johnston, Senior Consultant, Telecommunications Consulting Group, BBN Communications



In this tutorial you'll learn what ISDN will and won't deliver in the late 1980s, what the emerging ISDN standards will mean in terms of new services and improved network performance, what holes still exist in the standards and trials, how to make smart buying decisions while keeping open your options for ISDN compatibility, and more. *Level:* Intermediate.



T-3 Strategic Planning for Corporate Information Networks

Leader: Dr. Howard Frank, Howard Frank Associates

Attend this tutorial to learn how to relate vendor offerings and technological trends to your organization's needs and requirements, and to develop a framework to plan future services and systems. You'll examine current issues in network integration, why communication departments must function as "mini telcos," and the pros and cons of software defined networks and private dedicated networks. *Level:* Introductory–Intermediate.



T-4 Planning and Designing Networks with the New Technology

Leader: Dr. John M. McQuillan, President, McQuillan Consulting

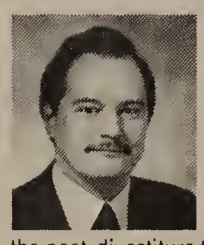
In this intensive seminar, you'll get acquainted with the key architectural principles used by today's leading network planners. You'll review emerging technologies such as T-1 networks, hybrids, VSATs, gateways between SNA, LANs and X.25, micro-mainframe links, and intercompany networks. You'll learn how to plan a corporate network using advanced technologies. *Level:* Advanced.



T-5 Building the Network Management and Technical Control Facility

Leader: Gabriel Kasperek, President, Kazcom Inc.

This one-day course will help you understand the strategic value of network control, explore alternative technologies for managing your network, and discover how to evaluate current technologies for use in your own organization. You'll become familiar with the test equipment you need for successful network control, and understand industry trends and future directions. *Level:* Introductory–Intermediate.



T-6 Designing Voice and Data Networks Under the New Tariffs

Leader: Robert L. Ellis, President, The ARIES Group Inc.

Take this tutorial to learn the structure of the post-divestiture tariffs, the latest January 1987 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics involved in configuring data networks, the LATA-pure strategy, and more. *Level:* Intermediate.



T-7 Managing the Telecommunications Resource

Leader: Gerald P. Ryan, President and Founder, Connections Telecommunications Inc.

This one-day course briefs you on how to develop a successful management environment. You'll learn what tools are available to do your job more professionally, how to plan a network management center, how to staff and train the department, and how to prepare and substantiate departmental budgets. *Level:* Intermediate.



T-8 IBM Token-Ring Versus Other LAN Choices

Leader: Dr. Kenneth J. Thurber, President, Architecture Technology Inc.

This tutorial gives you an across-the-board overview of announced products, future plans, compatible products, and IBM's overall strategy with respect to Token-Ring technology. You'll discuss the Token-Ring's relationship to IEEE 802.5, the IBM cabling systems and hosts, get an in-depth look at NETBIOS and APPC/LU 6.2 interfaces, and more. *Level:* Intermediate.



T-9 VSAT Technology and Implementation

Leader: Dr. Jerome G. Lucas, President, TeleStrategies

Learn the basics of applying very small aperture terminal (VSAT) satellite communications to your networking needs. You'll get acquainted with basic application requirements in SNA networking, data broadcasting, PC networking, video broadcasting, and teleconferencing. *Level:* Intermediate.



T-10 IBM's Systems Network Architecture (SNA): A Detailed Road Map

Leader: Daniel Zatyko, President, Zatyko Associates

Enroll in this intensive one-day tutorial to understand the evolution of SNA, and learn fundamental SNA concepts—the seven SNA architectural layers, SNA's physical and logical addressing, strategic SNA products, components of NetView, Token-Ring networks, functionality and capabilities of the LU 6.2/APPC and NETBIOS interfaces, and more. *Level:* Intermediate.



T-11 An Introduction to Data Communications Today

Leader: Gary Audin, President, Delphi Inc.

This course introduces you to the basic concepts, terminology and technology of data communications. You'll learn how various networks operate and how to select them; how best to interconnect computers, terminals, and PCs using different protocols; and what software is necessary to support protocols and network management. *Level:* Introductory



T-12 Understanding the Communications Regulatory Environment

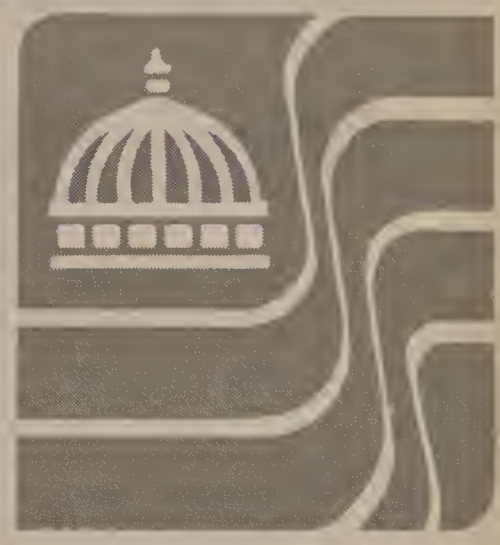
Leader: Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding

Enroll in this tutorial to learn how telecommunications policy is made and changed, what agencies are active in policy making, how industry segments are affected by current policies, what key issues are now under consideration, and how you can influence future decisions. *Level:* Introductory

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Technical Keynote: **Lincoln Faurer,** President and CEO, Corporation for Open Systems

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Opinions

AT&T POLICY

JAMES CARLINI

Make long distance, not war

With its recent interest in buying Electronic Data Systems, AT&T is showing that it wants to battle for a stronger foothold in the area of computers and information processing consulting. This is not a new battle cry, however, nor is it one that users should take seriously.

There was a time when AT&T thought it would outsell everybody in computers. AT&T insiders believed that with customers' premises as the battlefield, the computer war would be easy to win. There was even a predivestiture game plan that included getting a general from the enemy's staff to spearhead the operation and to build AT&T's marketing army.

An elite group was formed from each of the operating company divisions to make up this new unregulated army. It included "account executives" who were really sales representatives, and technical marketing support personnel, some of whom were put through a special forces training program called the Communications Systems Representative/Business Systems curriculum.

This training included courses in network design, consulting, CICS, IMS, operating systems, systems programming and other data communications and computer science topics — some taught by Massachusetts Institute of Technology professors. The training was intended to create consultants who could understand the big picture of integrating information and communications systems in an end-user organization.

These trainees heard promises of glory, promotions and opportunities. While going through all of this training, one astute recruit observed that AT&T was using them as cannon fodder — their efforts after training were to be used as a holding action for AT&T until it could get its act together after divestiture.

That was five years ago; AT&T never won the war.

A lot of generals left, some transferred from the front lines of American Bell — now called AT&T Information Systems — to the rear echelon of AT&T, while others retired or retreated, after only a couple of months, to the operating companies. Taking the lead from the generals, some of the account executives and newly trained technical marketing staff left the company after the initial divestiture, which created the unregulated subsidiary AT&T Information Systems.

AT&T never got the full benefit from all the training it provided to those employees, and casualties mounted after the official divestiture on Jan. 1, 1984. By that time, many of the freshly trained elite forces saw that it was a no-win situation because AT&T had decided to focus on selling private branch exchanges rather than on technical knowledge in integrated information systems consulting. This shift in priorities left a gap between the available firepower and actual expended expertise.

The troops as well as the customers in the AT&T trenches were confused, which caused morale to sink at AT&T Information Systems. Weapons such as Net 1000 never got to the front lines, nor did the reorganized account teams. Policy changed repeatedly regarding the company's No. 1 priority in dominating the market in the land of computers, communications and information systems.

Now, with the latest regrouping of AT&T forces and new battle cries for a consolidated AT&T front, the user issues are which software, network and computer products should be implemented in their organizations. If history is a good indication of the future, customers should not get too comfortable with their new consolidated account teams, who seldom last for more than 12 months.

With all the choices available to them, combined with the complexity of putting them together to build information systems, users might be wise to hire some AT&T veterans who went through all of that intensive training to manage the implementation and integration of their information systems technology. Otherwise, user organizations could easily become a new battleground upon which vendors will freely experiment with new strategic weapons and policy — with the end user as the target.

Make long distance, not war.

Carlini is president of Carlini & Associates, a management consulting firm in Westmont, Ill. He also lectures on information technology at Northwestern University in Evanston, Ill.

OFFICE INFORMATION SYSTEMS

WALTER ULRICH

Vendors vie for lead

This year has brought dramatic advances in office information systems. New product announcements and enhancements have made office systems more effective and easier to use, while users report increased interest in evaluation and implementation.

Office information systems will have a big impact on corporate networks. For this reason, communications managers must understand the implications of this year's product announcements. Vendors are maneuvering for market position now. Here's how the market is shaping up:

■ The announcement of the 9370, a rack-mounted super minicomputer, may have been IBM's most significant offering in 1986. The smallest configuration, which supports an entry-level version of IBM's VM operating system, is priced at $31,000.

With its new transparent service access facility, IBM contends that software on a 9370 can be maintained remotely from a central data center. The 9370's performance overlaps IBM's System/36 and the low end of the 4300 product line. Delivery will be phased, beginning in the third quarter of 1987.

In the same announcement, IBM introduced graduated software pricing. Rather than having a single fixed price for its software, the license fees for software will vary depending upon the machine on which it runs. Graduated pricing is essential if IBM is to avoid pricing itself out of the distributed and small office system markets.

The 9370 introduction underscores IBM's commitment to distributed processing. The company's most successful office system product, the Professional Office System (PROFS), runs under the VM operating system. Big Blue can now promise its customers PROFS on a departmental system, which will communicate easily with the corporate data center.

IBM's 9370 also demonstrates the computer giant's intention to rationalize its product line. The company is evolving to a single system architecture for office information systems that will go under Personal Services.

Personal Services is the family of electronic mail and related services, encompassing the IBM Personal Computer and System/3X line as well as the 370 line of mainframes. In fact, within IBM, PROFS is sometimes referred to as Personal Services/VM, or PS/VM.

Clearly, the 9370 is targeted to compete with Digital Equipment Corp. by filling a hole in IBM's product line that the System/36 was not able to plug. Many analysts speculate that Big Blue announced the 9370 far ahead of delivery dates in order to stem the tide of customers moving to DEC.

However, it is unclear whether users will react favorably to mainframe operating systems in their office system environments. Furthermore, it's uncertain whether the 9370 will be as easy to use as minicomputer buyers have come to expect.

■ DEC deserves praise as the office information systems vendor success story of 1986. The company's office systems are among the best available, and its fall introduction of Personal Computer All-in-1 makes the personal computer a full partner in DEC's office automation strategy. DEC has a solid product and a sound strategy.

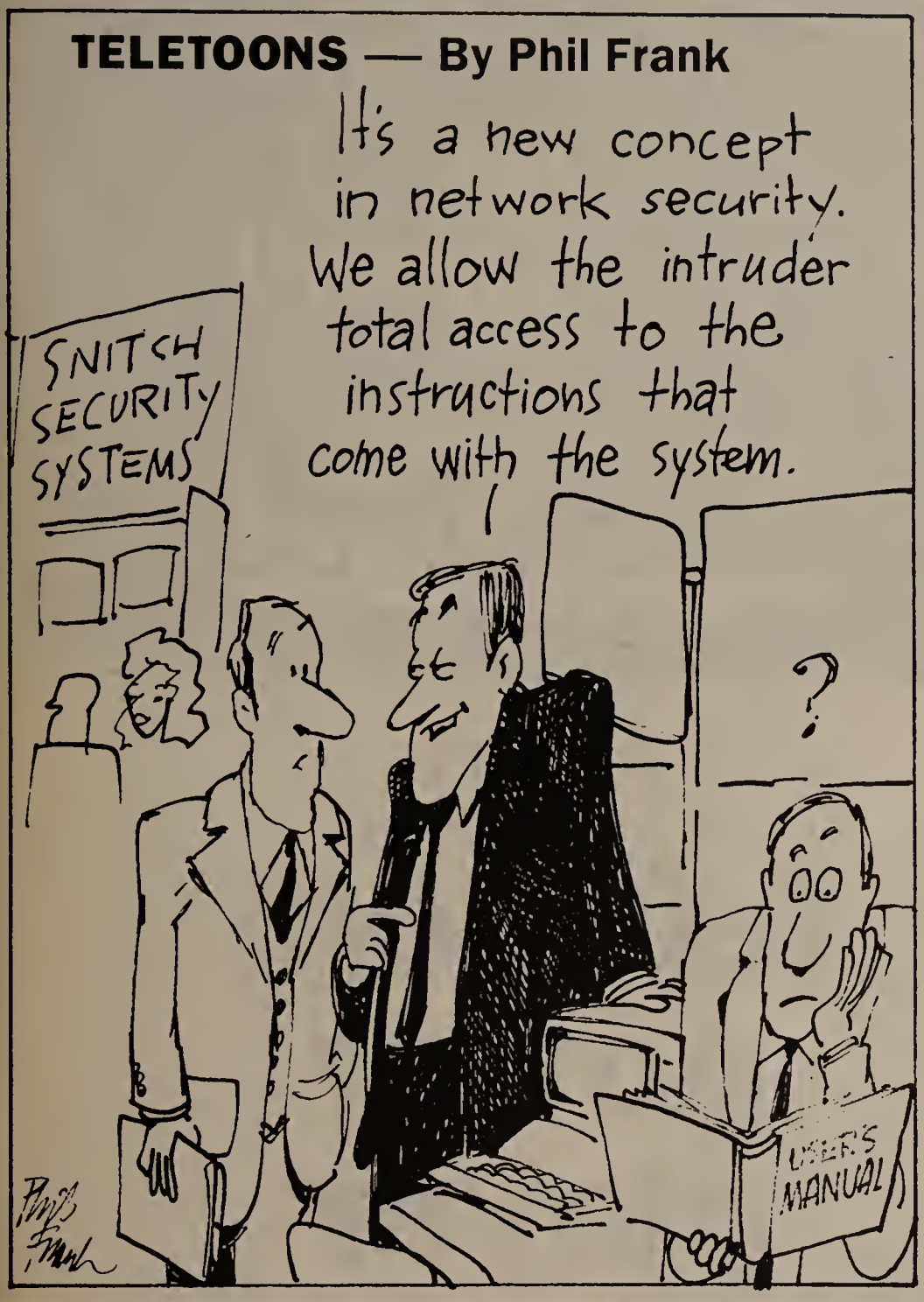
All-in-1 is a full-featured office system running on DEC minicomputers. Customers who require a full-featured office system will

Ulrich, a partner in Coopers & Lybrand, manages the firm's Walter Ulrich Consulting subsidiary in Houston.

Disagree with an opinion expressed here? Give us a piece of your mind. *Network World* is soliciting guest columns for its opinions pages. Manuscripts must be letter-quality, double-spaced and approximately 800 words in length. Disk and modem submissions are preferred. Columns should be timely, controversial, literate and technically accurate. Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 584.

Opinions

TELETOONS — By Phil Frank



consider All-in-1 a front-runner.

Users are also looking for systems that preserve the existing investment in personal computer workstations. All-in-1 does more than just smoothly integrate the personal computer into the office system network. It uses the intelligence of the personal computer to optimize the user interface and improve shared office resource productivity.

■ Data General Corp.'s strategy is to coexist with IBM, and it has been a forerunner in developing Systems Network Architecture integration and DISOSS compatibility.

The 9370, were it a currently available product, would be a major threat to DG. Clearly, IBM wants the customer to buy the 9370, rather than a DG product, for the distributed or departmental solution.

However, as long as questions remain about the 9370 and its availability, DG will continue to make inroads against the IBM installed base.

Like DEC's All-in-1, DG's Comprehensive Electronic Office runs on minicomputers. But DG does not have an answer for customers who wish to preserve their investment in personal computers. This is a major weakness.

■ Wang Laboratories, Inc., a pioneer in office systems, is in a state of flux, and it is difficult to predict its future. The company owes its success to word processing. However, as the industry moved to integrated office systems for both secretaries and executives, Wang fell behind.

Recently, Wang has said it wants to be an integrator of incompatible systems for users. It boasts of its communications expertise and has a wide array of communications offerings to back up its claims. The company is creating bridges to IBM, DEC, DG and perhaps others.

Wang's office system, Wang Office, has evolved from a historic focus on word processing to a more successful combination of its office support and word processing functions.

In addition, Wang's answer for those wishing to integrate personal computers into an office system is expected in 1987.

One common theme stands out as the key to the strategies of all the vendors — communications. Both compatibility and integration are the bywords.

Ken Olsen, president of DEC, says that he who controls the net-

See **Common** page 35

PEER NETWORKS

MICHAEL DURR

Say adios to the host

For the past several years, a favorite topic of communications analysts and high-tech editors has been the comparison between minicomputers and local-area networks. The problem with the discussion is that it's an apples-and-oranges argument. The mini is essentially a processing system, smaller than a mainframe and bigger than a microcomputer.

The local network, on the other hand, is not a processor system; it's a communications system that can support any size processor. The emerging relationship between minis and local nets is not one of conflict, but of cooperation.

The real issue deserving analysis is host networks vs. peer networks. In this contest, peer networks are clearly the winner and will become the dominant network architecture as they replace or absorb increasingly obsolete host systems.

A host network relies on a central, shared processor for all of its intelligence. Workstations are either dumb terminals or personal computers emulating dumb terminals. Such a system is hierarchical: communications, management or processing tasks can be initiated at the workstation level, but they must be routed up through the host to be implemented.

A peer network, by comparison, is a distributed system. Communications can occur directly between any nodes on the system; a workstation can talk to another workstation or application without having to go through the host. The most familiar peer networks are departmental personal computer local-area nets, but the same architecture is ideal for companywide systems.

The fundamental advantage of the peer network is it's economical. There are three levels in computer processing. The lowest level is the workstation; next is the departmental or work group system; and the third, or highest level, is the company mainframe computer.

Durr is public relations manager for Novell, Inc., a local-area network company in Orem, Utah, and author of several books, including Micro to Mainframe, *published by the Addison Wesley Publishing Company, Inc.*

Communications and host processing are expensive. In a peer network, these costs are reduced by keeping most activity at the lowest possible level. Processing occurs typically at the personal computer workstation, and most communication remains within the work group. The effect is to decrease the capacity requirements of the communications system and to reduce the need for mainframe processing, thereby reducing costs.

On a host network, if two users want to communicate, that communication must go through a host. And if two applications want to communicate, that must also go through the host. In other words, every end-user request must travel a maximum distance from its origination and must be executed at the highest level processor. This wasteful use of resources is expensive.

Host networks were developed at a time when processing power was an expensive resource. It made sense to share that resource among as many users as possible. But that's no longer the situation. Processor costs have dropped to the point where diskless personal computer workstations, complete with network adapters, are now available within the price range of dumb terminals.

Besides reducing costs, peer networking is a flexible architecture that improves the computing environment in several ways. The following improvements are based on distributed processing with the personal computer as a workstation: greater end-user control of personal data, easier to use software, consistent response times and superior keyboard control.

Some of the improvements are based on distributed application processing, which conforms to the most common type of processing — the manipulation of small amounts of data. An inventory record change, a text file update and even a large spreadsheet recalculation are handled easily in the CPU of a personal computer by keeping the data at the lowest level possible.

But not all applications are suitable for distributed processing. Some should be centralized. For example, a data base application is a set of programs that include data entry, querying, in-

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NETWORK WORLD

Features

December 22, 1986

Among all the entries in *Network World*'s second annual User Excellence Award competition, Florida Power & Light Co. and First Wisconsin National Bank of Milwaukee stand out as aggressive innovators in their industries. Networking strategies are crucial to both companies' efforts to grow through better communications with their customers. Join *Network World* in congratulating the award winners during a special luncheon on Monday, Feb. 9 at the Communication Networks '87 conference in Washington, D.C.

1 While other managers may be complaining about their problems, the telecommunications department at Florida Power & Light, first-place winner of *Network World*'s second annual User Excellence Awards, is acting decisively. The company's task forces tackle communications problems ranging from constructing a fiber-optic net to cutting operating costs.

33 As other banks compound communications costs, First Wisconsin National Bank of Milwaukee relies on technology and teamwork to contain its expenses. The bank has coined a network architecture that implements cutting-edge technologies to upgrade service and hold the line on spending. The innovation and dedication of First Wisconsin's networking staff distinguishes it as *Network World*'s User Excellence runner-up.

2nd Annual User Excellence Award

FIRST PLACE

Telecom power player

Florida Power & Light illuminates the Sunshine State

Continued from page 1

items, such as administrative tasks, as well as major projects, such as designing a new communications network.

John J. Hudiburg, chairman of the company's board of directors, says the goal of the program is to make the company the best-managed electric utility in the U.S., to make it an excellent company overall and to have it be recognized as such.

Movers and solvers

As part of the program, ad-hoc quality improvement teams were formed to deal with problems identified by employees. With nicknames such as the Glitchbusters, the groups rectify annoying issues and help the company run more efficiently. For example, telecommunications department employees noted that critical files often could not be found when certain employees were absent. A team addressed that problem by designing a system in which employees clearly mark needed information and store it in unlocked file cabinets.

Such a solution sounds relatively straightforward. But in many large corporations, minor inconveniences repeatedly go uncorrected. If a company addresses problems that are as minor as a poor manual filing system, then it's not surprising to find that company dealing

☞ See **Florida** page 32



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Florida from **page 30**
with more important issues, such as how to design communications applications that help the company operate more smoothly.

Florida Power & Light's telecommunications department, which numbers 35 people, has played a key role in developing such applications for the company's 2.6 million customers and its 13,600 employees located in 67 service offices, 46 business offices and 11 power plants. The department has also helped increase corporate efficiency and cut operating costs.

One application enables customer service representatives to access an on-line data base and answer customers' questions about their service or account. "A lot of people only live in Florida during one season," says Everett C. Stonebraker, telecommunications coordinator at Florida Power & Light. "The on-line system enables them to set a date when they want their power shut off."

Earlier this year, some workers were equipped with hand-held electronic meter readers. The workers key power usage information into the device, return to one of the company's service offices and download the information to the company's host computer over leased or dial-up lines. Bills are generated and mailed out the following day.

In addition to shortening the billing cycle, the new application reduces the number of incorrect billings. Sometimes, meter readers make a mistake as they transcribe information from paper to computer. By eliminating this step, the new application has to cut down

> "A lot of people only live in Florida during one season," Stonebraker says. "The on-line system enables them to set a date when they want their power shut off."

this problem.

A similar application was designed for most commercial customers and some selected residential customers. At each meter, Florida Power & Light has installed a special meter reading device, based on an Intel Corp. 8086 microprocessor. The device stores power usage information and can be interrogated and instructed to download information to a host via dial-up lines. The computer then prepares customer bills.

Another application enables the company to take part in a cooperative power sharing program. Control Data Corp. supercomputers print out reports indicating if Florida Power & Light has a surplus or a shortage of power. Information from the reports is then keyed into an ASCII terminal and transmitted to a company that acts as a power company brokerage house. Companies are then able to sell excess capacity or purchase more power.

> Florida Power & Light longs for one net management package to control the entire network, but is not optimistic about finding such a package. "Some vendors are good in some areas, others in others."

To improve its field service, Florida Power & Light has been testing a two-way analog radio network. Notices of power outages are sent from customer service offices to a host computer. From the number of calls received, the computer determines if the problem is an isolated incident or a more serious problem, such as a severed power line.

Information about the type of problem and the location is sent via digital leased lines to a dispatcher in the Ft. Lauderdale, Fla., service center. Service trucks are equipped with two-way microwave terminals that notify the dispatcher of vehicle locations. The dispatcher then determines which truck is closest and sends it to the site.

"Making sure that we supply our customers with power is the company's No. 1 priority," says J.E. Hicks, who is supervisor of telecommunications operations at the company. "This application helps to keep our customers satisfied." The pilot program is being used with 18 trucks and may be expanded next year.

Currently, separate voice and data networks support the company's diverse applications. The voice network has a two-step tandem design. Remote offices use more than 60 private branch exchanges to feed into four Northern Telecom, Inc. SL-1 PBXs, which act as network hubs. Approximately 450 voice circuits support voice traffic.

At the center of the data network sits an IBM 3090 mainframe. The company does little distributed data processing for two reasons. First, the mainframes supply the least expensive way of supporting the company's applications. Also, the utility works with sensitive information, such as data about its nuclear plants, and is leery of currently available security packages. "We plan to evaluate the IBM 9370, and we may use it for some distributed applications," Stonebraker says.

General DataComm Industries, Inc. multiplexers and Codex Corp. modems connect remote terminal users to the central site. Two Amdahl Corp. 4705 front-end processors and an IBM 3725 front-end processor feed that data to the central mainframe.

In October, Florida Power & Light installed a backup data center in Juno Beach, Fla. Timeplex, Inc. Link/1 multiplexers tie the remote and central sites together.

More than 225 circuits are used exclusively on the data network, and another 150 circuits are shared between voice and data applications. Southern Bell Telephone and Telegraph Co. supplies most of the circuits. The company uses local circuits because customers and employees are concentrated in a 27,000-square-mile area in western Florida. AT&T supplies the few long-distance circuits needed.

Bullish on bypass

Like many large companies, Florida Power & Light has been evaluating its bypass options. In the second quarter of 1987, the company plans to begin installing a multimillion-dollar fiber network. A fiber backbone operating at speeds of at least 500M bit/sec will run from the company's power plant at Turkey Point, in southern Florida, to St. Lucie, in the northern part of the state. The fiber network, which will be 220 miles long, will integrate the two existing networks. Users and customers will be able to access the network at 17 points.

Willie Tomas, fiber-optic project supervisor at the company, says that the fiber network will enable the company to cut costs, increase the reliability of various circuits and help the department respond more quickly to user needs. The net, which should be completed by the end of 1988, will enable the utility to support high bandwidth applications. A few planned applications will work with T-3 lines, which transmit data at speeds of 45M bit/sec.

One application will link the central and remote sites by a fiber line. Another will enhance an existing free-frame videoconferencing network that connects two locations to a full-motion broadcast system linking five sites.

In addition to the fiber network, other items are on next year's agenda. Florida Power & Light plans to start purchasing Personal Computer clones instead of IBM Personal Computers. Second, a standard for a local-area network and a primary supplier will be chosen. Currently, the company is working with 10 local nets and equipment from half a dozen suppliers.

Network management is another key issue. Presently, a collage of packages monitors pieces of the networks. Florida Power & Light longs for one net management package to control the entire network, but is not optimistic about finding such a package. "Some vendors are good in some areas, others in others," Tomas said. "No one has one package that does a good job at everything. We may design a package ourselves."

Purchasing technically elegant products is tempting, but discriminating managers are always interested in bottom-line results. Earlier this year, Northern Telecom was asked to evaluate Florida Power & Light's network. Karen Siegal, network design engineer at Northern Telecom, says that the network was one of the most cost-effective the company ever evaluated. R.A. Ward, supervisor of telecommunications engineering at Florida Power & Light, says that the telecommunications costs for a typical terminal are only $120 per year.

Microcomputers may be gathering dust on many telecommunica-

> The fiber network will enable the company to cut costs, increase the reliability of various circuits and help the department respond more quickly to user needs.

tions managers' desks, but Florida Power & Light makes maximum use of the machines. The utility relies on personal computers and statistics to keep the network operating efficiently. One employee wrote a network optimization program that helps the company design its networks. Another wrote a program that tracks the progress of various projects.

"We are relying more and more on statistics to help us do our jobs," Stonebraker says. For example, a set of graphics reports recently illustrated the performance of network modems. The reports indicated that the company could increase network reliability by replacing some analog circuits with digital circuits. Network downtime dropped from 1.3% to 0.2% when the digital circuits were installed.

The increase in network availability is yet another accomplishment of a telecommunications department that is not merely talking about its network problems, but is solving them.

NETWORK WORLD

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1 My primary areas of activity. (Circle ONE only)
I am involved in evaluating communications (data, voice and/or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) _____

1a For communications, my primary responsibility is: (Circle ONE only)
1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) _____

2 Circle only the ONE title classification which most applies to you.

Company Management
11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications
21. Management
VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff:
Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications
31. Management
VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications
41. Management
42. Supervisory/Staff

MIS/Data Processing
51. Management
VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications

Others
75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other _____

3 Job Function
Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)

Corporate
1. Business Management, Planning and/or Development

Communications System/Network
2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other _____

4 Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)

Consultants
11. DP/Communications Consulting Services
12. Consulting Services (except DP/ Communications)

End Users
13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors
41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other _____

5 In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 Check ALL that apply in columns A and B.
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A	B	Product/Services
		Computers
☐	☐	01. Micros
☐	☐	02. Minis
☐	☐	03. Mainframes
☐	☐	34. Printers
		Data Communications
☐	☐	04. Communications Processors
☐	☐	05. Comm./Networks Software
☐	☐	06. Digital Switching Equipment
☐	☐	07. Facsimile
☐	☐	08. Modems
☐	☐	09. Multiplexers
☐	☐	10. Protocol Converters
☐	☐	11. Network Mgmt. & Control
☐	☐	12. Test Equipment
☐	☐	13. 3270 Controllers
☐	☐	35. Intelligent Terminals
		Telecommunications
☐	☐	14. PBXs
☐	☐	15. Key Systems
☐	☐	16. Central Office Equipment
☐	☐	17. Integrated Voice/Data Terminals

A	B	Product/Services
		Transmission/Network Services Equipment
☐	☐	18. Microwave
☐	☐	19. Satellite Earth Stations
☐	☐	20. Local Area Networks
☐	☐	21. Wide Area Networks
☐	☐	22. Packet Switching Equipment
☐	☐	23. Fiber Optic Equipment
☐	☐	36. T1
		Communications Services
☐	☐	24. Packet Switching Services
☐	☐	25. Cellular Mobile Radio Services
☐	☐	26. Electronic Mail
☐	☐	27. Enhanced Services
☐	☐	28. Centrex
☐	☐	29. Long Haul Services
☐	☐	30. BOC Services
☐	☐	31. Independent Telco Services
		Other
☐	☐	32. Factory Communications
☐	☐	33. Online Data Bases

7 Estimated value of communications systems, equipment and services:
A. which you helped specify, recommend or approve in *last* 12 months? (Check only ONE in column A.)
B. which you plan to specify,recommend or approve in *next* 12 months? (Check only ONE in column B.)

A	B		A	B	
1. ☐	☐	$10 million and over	6. ☐	☐	$100,000 - $249,999
2. ☐	☐	$5 million - $9.9 million	7. ☐	☐	$50,000 - $99,999
3. ☐	☐	$1 million - $4.9 million	8. ☐	☐	Under $50,000
4. ☐	☐	$500,000 - $999,999	9. ☐	☐	Don't Know
5. ☐	☐	$250,000 - $499,999			

8 Estimated gross annual revenues for your entire company/institution:
(Circle ONE only)
1. Over $1 billion
2. $500 million to $1 billion
3. $100 million to $499.9 million
4. $50 million to $99.9 million
5. $10 million to $49.9 million
6. $5 million to $9.9 million
7. under $5 million

9 Estimated number of total employees at this location:
(Circle ONE only)
1. Over 5,000
2. 1,000 - 4,999
3. 500 - 999
4. 250 - 499
5. 100 - 249
6. 50 - 99
7. 20 - 49
8. 1 - 19

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From top down: Ron Jaeger, Robert Harrold, Gerald Ried, Mike Spillane and Garrett O'Reilly

2nd Annual User Excellence Award



▶ SECOND PLACE

Banking on high-tech teamwork

First Wisconsin strikes it rich through innovation and dedication.

BY BYRON BELITSOS
Special to Network World

In a year that witnessed a rash of bank failures and the near collapse of Bank of America's empire, marketplace survival in today's deregulated banking industry means containing costs and improving customer service. Network strategy is a central arena in this fight for competitive survival, as voice/data networks become the critical delivery vehicles for nearly all banking services in the late 1980s.

In this volatile networking environment, First Wisconsin National Bank of Milwaukee, this year's runner-up in the Second Annual User Excellence Awards, is living proof that banks can wield new networking technologies as competitive weapons.

First Wisconsin's example shows that the right mix of cutting-edge transmission technologies, network management tools and teamwork can keep a lid on costs while up-

See **Banking** page 34

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Banking from **page 33**
grading service.

The bank has managed to stabilize its communications costs when most competitors' postdivestiture costs are skyrocketing. In addition, First Wisconsin is rapidly completing a private T-1 backbone network for integrated voice/data transmission that will serve more than 300 banking sites in a four-state region.

Among the bank's service achievements are 99.8% network availability during prime-time hours, average response times less than three seconds and the ability to complete 95% of all transactions in less than eight seconds — statistics that may be unmatched by any similar network in the U.S.

First Wisconsin is also among the first organizations in the country to design a network that incorporates a number of cutting-edge technologies, including fiber links to a Bell operating company's central office, integrated voice/data transmission over T-1 lines and channel-extension technology.

Finally, First Wisconsin data communications programmers are, at IBM's request, optimizing an IBM financial communications application and have developed network performance monitoring software that outperforms IBM's own monitoring program.

To visit First Wisconsin networking wizards in the bank's data services center in a Milwaukee suburb is to meet a spirited team of professionals, with no one member taking credit for the group's achievements.

The award-winning networking department, known as Technology Research and Information Processing Services (TRIPS), embraces research, planning, design and operations for voice/data communications, as well as for other data processing services, and reports to the bank's Information Systems Division. Key TRIPS team players told their story in a recent *Network World* group interview.

"What makes us unique is the quality of service we offer. The technology is key to this, but more than anything else it's people — the team — that makes the difference," says Mike Spillane, manager of network control for First Wisconsin.

"By marrying a wide range of products and services with the efforts of a good team of people, in an era in which most other companies' communications costs are escalating by leaps and bounds, we have been able to contain ours for a period that will include the next five years," explains Robert Harrold, First Wisconsin's data communications technology consultant.

"After divestiture," continues Harrold, "AT&T had given us estimates that indicated our costs might nearly triple. Today, our costs have stabilized to the level we were incurring prior to divestiture."

Gerald Ried, vice-president of TRIPS, enunciates the department's strategic vision. "I believe the communications costs of our competitors in the region have gone up significantly compared with ours," claims Ried. "None have pursued a systematic bypass which includes private T-1 facilities. Our ability to marry voice and data over our T-1 backbone, for example, will allow us to accrue savings of $150,000 in 1987 on phone calls alone from our regional processing centers into the Milwaukee headquarters," Ried says.

Channel-extension technology is another example of an innovative First Wisconsin cost-cutting tool provided by Paradyne Corp., a major vendor of multiplexers and modems. Paradyne's Pixnet XL channel-extension system enables high-speed devices such as laser printers and check reader/sorters to be placed miles away and still function as if locally attached. Some of the I/O devices on the First Wisconsin network are as far as 300 miles away from the data center.

"We were the first in the country to install Paradyne's Pixnet XL channel-extension technology. It's a great cost-cutter because it allows us to drive devices at sites as large as our downtown processing center without on-site computers," Harrold says.

First Wisconsin is the largest bank in the state and is owned by Wisconsin's largest holding company, First Wisconsin Corp. The holding company owns 27 other banks, as well as trust, finance, real estate and insurance operations, all of which are linked to the network services provided by TRIPS. In addition, TRIPS operates as a networking and data processing service bureau for 185 other correspondent banks in four states in the Midwest region.

"We're unique in that we are part of a $6.5 billion company, but we do processing for over 200 banks, which makes us seem like part of a $50 billion operation," explains Ried.

Four point-to-point T-1 links carry First Wisconsin's network into the surrounding local access and transport areas. The T-1 links terminate at nodes located in the bank's suburban data center and at bank headquarters in downtown Milwaukee. The headquarters connects to the data center, which is 15 miles away, via three T-1 links. Termination points also include Madison in south-central Wisconsin, Eau Claire in northwestern Wisconsin and Oshkosh in the northeast region of the state.

These sites also operate as major remote processing centers for check input and printed output for the member banks or correspondent banks in that locale, linked through 56K-bit analog intra-LATA circuits. The T-1s carry 60% of the total data traffic.

"In 1987, we will install intelligent T-1 muxes, allowing alternate routing, dynamic bandwidth allocation and improved diagnostics," Harrold says. "In the interim, we are relying on digital access cross-connect switches to provide alternative routing. If we lose any T-1 lines, the DACs allow us to switch any traffic carried on that line around the other way, so there are always two ways of getting back to our data center from any place on the network.

"The T-1s are linked in a ring configuration," adds Harrold. "That's very critical. We can't afford to have any nodes go out."

"The strategy for voice lies in looking for ways to leverage the T-1 network to carry voice traffic," says Jim Laux, the bank's telecommunications technology consultant responsible for voice network planning. "Many companies are migrating away from maintaining bypass or private-line-based networks because of recent declines in long-distance dial-up services.

"But our network is justified on data and not voice," Laux says, "and voice virtually rides free on our private data backbone network. A lot of companies put in T-1s to save money on voice and let the data run free, but we had the opposite approach."

Laux adds that a reseller carries the bulk of the company's dial-up voice traffic services. "We have engineered the network for a minimum of overflow to direct-distance dial — less than 10%."

IBM apparently has something to learn from the innovators at First Wisconsin's data center, judging from two cutting-edge projects initiated at the bank in early 1986.

According to Garrett O'Reilly, teller systems technology consultant who handles workstations, CRTs and teller stations for TRIPS, IBM approached First Wisconsin this year to propose a joint project for developing the IBM 4700 finance communications system. O'Reilly says that First Wisconsin's teller systems software people are working with IBM's programmers in Charlotte, N.C., to write and test applications to run on a new operating system. "They looked at all the banks in the country and chose to work with us," says TRIPS' Ried.

IBM may also learn some lessons from a project that is being developed by Ron Jaeger, assistant vice-president of data network services, whose group ties together three main areas — the teller systems team, the data communications software support group and network control.

In mid-1986, Jaeger brought in Spillane to handle network control. "We saw that the network had to fall into our hands in every way, from network implementation, to troubleshooting, to expert diagnostics, to real-time control. This was Mike's work."

Spillane has extensive experience as a network software support analyst for First Wisconsin. His input to the data services group sparked a number of innovative network management software solutions, but the principal one is software developed in-house by systems programmer Gary Albright that allows the group to generate customized network performance reports. The reports provide far more useful measurements than IBM's own network monitoring system, according to Spillane.

The fully automated system takes the raw data generated by IBM's Network Performance Monitor (NPM), which Spillane calls "not very useful for a manager in the form it is made available," and unites it with the network data base, which is a repository of everything that happens on the system.

"In the past, we would attempt to decipher the unwieldy NPM output long after a problem had already been detected by an operator. Now, by merging the NPM data and the network data base, we can generate a report that shows the status of all the network links at 15-minute intervals." A summary report appears on Spillane's desk at 7:30 every morning.

The report allows Spillane to get a quick handle on when a line is starting to degrade. "When we first started running the program, the number of retransmissions we were seeing on some lines was in the tens of thousands," he says. "Now we are catching the problem before the first hundred retransmissions."

"We think IBM has something to learn from us about reporting network performance to management," Spillane says proudly.

Belitsos is president of Lexicom Research, a San Francisco-based firm that offers writing and research services for the telecommunications industry. He is coauthor of the recently published book Telematics: Corporate Networks for the Information Age *(Dow Jones-Irwin, Homewood, Ill.).*

First Wisconsin's example shows that the right mix of cutting-edge transmission technologies, network management tools and teamwork can keep a lid on costs while upgrading service.

Among the bank's service achievements are average response times less than three seconds.

Letters

Tariff anomalies

I read with interest the article in the Oct. 13 issue describing the troubles that Color Tile Supermart, Inc. was having with a private line it had ordered from AT&T Communications, Inc. ("Rate element zaps retailer," *NW*).

In particular it had a 68-mile local channel from AT&T's central office in Harrison, Ark. to Melbourne, Ark. AT&T's July 1 changes to its local channel rates increased the monthly charge for this connection from $379.01 to $1,248.59.

The point in Melbourne is served by Liberty Telephone, a subsidiary of Century Telephone and a National Exchange Carrier Association (NECA)-concurring carrier. This telephone company was not General Telephone, the predominant independent in the Little Rock, Ark. local access and transport area and the company whose rates AT&T used as the basis for setting its local channel rates to points in that LATA that are served by independents.

Unfortunately for Color Tile's local channel, General Telephone's rates were much higher than the NECA rates used by Liberty Telephone. Also in the article is the mention that Color Tile could have avoided the billing anomaly by ordering the circuit as coordinated access, but that they were unwilling to assume the extra responsibilities they thought they were liable for in maintaining end-to-end service themselves.

As a first comment, under AT&T's federal tariff, coordinated access is clearly a form of total service. Total service exists if a private-line customer pays for the Access Coordination Function (ACF), whether the local connection is provided by (a) AT&T under Federal Communications Commission Tariff 11, (b) the customer from facilities acquired directly from the local operating companies, or (c) for the very contentious, from customer-provided bypass facilities that meet AT&T's technical specifications. Under total service, AT&T undertakes the operational management of a circuit, from ordering to installation to end-to-end service and maintenance. AT&T collects $9.30 per month per voice-grade drop as ACF charges, for this year.

As an entirely different issue, an AT&T private line customer can choose to have AT&T undertake the overall administrative management of the various piece-parts of a circuit by ordering the local connections as resold local channels under FCC Tariff 11. In this case, AT&T would handle the billing and administrative functions in rendering a single bill for all components of a federal private line. A private-line customer can also choose to have orders for the local connections made by AT&T in his name and to have the bills for these local connections sent directly to him. For this administrative management, AT&T collects $4 per termination per month, plus a 10.1% surcharge on the underlying access charges billed to AT&T by the local operating companies. As we have seen in Color Tile's case, AT&T also uses the rates of the predominant independent to approximate its actual access charges to points served by independent telephone companies in a particular LATA. In some cases this approximation is not very good.

The actual access expenses that AT&T pays for this local channel, from Color Tile's facility in Melbourne to AT&T's Central Office in Harrison, are not based entirely on the rates of Liberty Telephone (the operating company that serves their facility) or under the tariff of Allied Telephone (the operating company that serves AT&T's central office). Since April 1986, multivendor local connections have come under "meet point billing." In other words, simplifying the issue significantly, AT&T's actual access charges for this local connection reflect the rates of a triple meet-point-billed access channel with three segments:

Under the NECA access tariff:

- From Melbourne, to a meet point into Southwestern Bell territory
- From Harrison, to a second meet point into Southwestern Bell Territory

Under Southwestern Bell's access tariff:

- Between the two meet points

Since NECA's and Southwestern Bell's access tariff have significantly lower mileage rates than General Telephone's, Color Tile's concern is clearly a legitimate one.

Robert L. Ellis
President
The Aries Group, Inc.
Rockville, Md.

The true identity of NTX Communications Corp.

Thank you for including NTX Communications Corp. in the Nov. 17 Feature Focus ("Communications processors weave the right connections," *NW*). NTX is a relatively new company specializing in hardware and software products that provide for high-speed (T-1 and above) data communications among IBM host processors within an IBM Systems Network Architecture environment.

Although NTX welcomes the opportunity for visibility within the communications industry, I must ensure that such references properly position NTX's products and services.

In the article, NTX's 3800 is classified as a network processor offering host channel expanders. NTX believes it should be classified as a front-end processor compatible with IBM's SNA/Synchronous Data Link Control protocol.

These corrections are intended to clarify NTX's product within a complex and sometimes confusing marketplace.

Thomas J. McKenna
President
NTX Communications Corp.
Sunnyvale, Calif.

Letters may be edited for space and clarity.

Pacific from **page 5**
ed-pair multifunction cable is used on each floor and the floors are connected via fiber-optic cable.

Data from the twisted-pair cables is multiplexed into the fiber cables and routed down to the basement where the Apollo servers are located. The servers are connected to an Apollo Domain coaxial cable network which operates at 12M bit/sec.

Pacific Bell's current solution is to link the personal computers to the Apollo net at 9.6K bit/sec.

Although the Burroughs mainframe is connected to an Apollo server, only those using the DN300 now access this mainframe via the network. The majority of the personal computer users are still directly connected to the Burroughs system, while a similar setup is used for those users needing to access the IBM mainframe.

Common from **page 29**
work controls the customer. The war between office systems vendors will be fought on the communications battlefield.

The onslaught of office information systems is both good news and bad news for the network manager. Office systems are coming rapidly, and the communications manager must learn how to integrate them into the communications infrastructure.

This is a task not to be taken lightly. It requires new technologies and innovative thinking. Ultimately, 80% of nonvoice communications will originate in one office system or another within the user's company.

The good news is that vendors recognize the communications implications, and they are working to resolve incompatibility problems before they arise. The network manager is influential, and vendors are looking for ways to satisfy his communications requirements.

Office information systems are being implemented in increasing numbers. The major vendors are improving their products and generating interest among their customers.

These systems are generating more traffic and will have a big impact on network design, routing, optimization and control.

Vendors have recognized communications technology as the electronic thread that ties their products together with those already installed on the user's premises.

Adios from **page 29**
dexing and sorting. Data entry and querying are best done in distributed workstations, but indexing and sorting work are accomplished most efficiently in a centralized processor. That's primarily because of the volume of transfers that are needed to index or sort in a distributed system. When users centralize those functions, they reduce the number of transfers and improve performance.

Flexible processing

Peer networks are flexible enough to allow centralized application processing where required. In this case, the indexing and sorting functions could be run in the network server while other data base functions remain in the personal computer workstation. This kind of partial distribution and partial centralization is found in the new generation of network applications expected to appear in 1987.

Protected systems

Until recently, an application running in the server wasn't feasible because it threatened system integrity. If the application crashed, it could bring down the entire network. Now, with the Intel Corp. 80286 and 80386 processors, this is no longer a problem. These chips can operate in protected mode with partitioned memory, so that a failure of the application program running in one part of memory will not affect the server software running in another part of memory.

Movement from host networks to peer networks doesn't mean that minicomputers or mainframes will go away. They won't. There will always be a need for larger machines to handle large processing jobs, but there are likely to be changes in those machines.

Today, users can attach a host system to a peer network through a protocol-converting gateway device. Peer protocols, like IBM's LU 6.2, are in the process of being ported to mainframes and minis. That will allow the processing power to be accessed from intelligent workstations on the peer network and will eliminate the need for terminals, terminal-emulation and the host network.

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* June 29 - ISDN

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* January 19 - T-1 Multiplexers
* February 16 - Network Management & Test
* March 9 - Local Area Networks
* March 30 - Digital PBX's (Med-High)
* April 20 - Microwave Transmission
* May 11 - Micro-to-Host Links
* June 1 - High Speed Modems

Service Focus

* January 26 - Software Defined Networks
* March 2 - Long Haul Carrier Private Line Services
* March 23 - Electronic Mail Services
* April 13 - Bulk Calling Services
* May 4 - BOC Services
* June 22 - Value Added Network Services (VAN's)

NETWORK WORLD publishes every Monday with an ad deadline of 10 days prior to each issue date. The January 12th issue will be closing January 2nd. You may send in copy to be pubset or camera-ready material (velox or negative) via the mail. We provide telecopier service and will also take ads over the phone.

Our mailing address is

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Calendar

Jan. 6-8, Washington, D.C. — An Introduction to Data Communications. Also, Jan. 12-14, Albuquerque, N.M.; Jan. 14-16, Hartford, Conn.; Jan. 21-23, Indianapolis. Contact: American Institute, 55 Main St., Madison, N.J. 07940.

Jan. 12-13, Dallas — Introduction to Telecommunications Systems: Technologies and Applications. Contact: BCR Enterprises, 950 York Road, Hinsdale, Ill. 60521.

Jan. 12-13, New York — Networking Personal Computers. Also, Jan. 29-30, Washington, D.C.; March. 12-13, New York; April 2-3, Miami. Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

Jan. 12-13, Dallas — MVS Overview. Contact: Acts Corp., P.O. Box 180, Kingsland, Texas. 78639.

Jan. 12-14, Los Angeles — IBM Products and Architectures. Also, Feb. 4-6, Chicago; Feb. 18-20, New York; March 4-6, Phoenix; March 11-13, San Jose, Calif. Contact: Center for Advanced Professional Education, 1820 E. Garry St., Suite 110, Santa Ana, Calif. 92705.

Jan. 14-16, Washington, D.C. — Protocols for Open System Interconnection. Contact: Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052.

Jan. 14-16, Washington, D.C. — Fiber-Optic Communications. Also, March 4-6, Chicago. Contact: BCR Enterprises, Inc., 950 York Road, Hinsdale, Ill. 60521.

Jan. 15-16, Minneapolis — X.25: Evaluating and Selecting Offerings and Options. Also, Jan. 29-30, Boston; Feb. 5-6, Atlanta; Feb. 19-20, Washington, D.C.; March 2-3, Los Angeles; March 5-6, San Jose, Calif. Contact: Center for Advanced Professional Education, 1820 E. Garry St., Suite 110, Santa Ana, Calif. 92705.

Jan. 18-21, San Antonio, Texas — Association of College and University Telecommunications Administrators' Winter Seminar. Contact: Association of College and University Telecommunications Administrators, 211 Nebraska Hall, Lincoln, Neb. 06855.

Jan. 19-21, Atlanta — SNA Concepts and Products. Contact: American Data Group, Inc., 1770 Indian Trail Road, Suite 295, Oakbrook Plaza, Norcross, Ga. 30093.

Jan. 19-21, New York — Data Communications I: An Introduction to Concepts and Systems. Also, March 16-18, New York; Feb. 2-4, San Francisco; April 27-29, Toronto. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Jan. 20-21, Los Angeles — SYSCON/87-West: OEM Computer Peripherals Sub-Systems Conference and Exposition. Contact: MultiDynamics, Inc., 17100 Norwalk Blvd., Suite 116, Cerritos, Calif. 90701.

Jan. 20-21, Orlando, Fla. — Understanding and Selecting Voice Messaging Systems. Contact: BCR Enterprises, Inc., 950 York Road, Hinsdale, Ill. 60521.

Jan. 22-23, Orlando, Fla. — Maximizing the Potential of Your Voice Messaging System. Contact: BCR Enterprises, Inc., 950 York Road, Hinsdale, Ill. 60521.

Jan. 28-30, New York — SNA Architecture and Implementation Seminar. Contact: Communications Solutions, Inc., 992 Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

Jan. 29-30, Boston — X.25: Evaluating and Selecting Offerings and Options. Also, Feb. 5-6, Atlanta; Feb. 19-20, Washington, D.C.; March 2-3, Los Angeles; March 5-6, San Jose, Calif. Contact: Center for Advanced Professional Education, 1820 E. Garry St., Suite 110, Santa Ana, Calif. 92705

Jan. 29-30, Washington, D.C. — Packet Tech '87. Contact: TeleStrategies, 1355 McLean Road, McLean, Va. 22101.

Feb. 2-6, Washington, D.C. — Understanding Microcomputer Data Communications: A Hands-On Approach. Contact: Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052.

Feb. 2-6, Atlanta — ACT/VTAM for Practitioners. Contact: American Data Group, Inc., Suite 295, 1770 Indian Trail Road, Norcross, Ga. 33093.

Feb. 5-6, Boston — An Intensive Introduction to T1 Networking. Also, Feb. 9-10, Atlanta; Feb. 12-13, Detroit; Feb. 19-20, Princeton, N.J. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

Feb. 9-11, Atlanta — Architecture and Operation of the IBM 3275. Contact: American Data Group, Inc., Suite 295, 1770 Indian Trail Road, Norcross, Ga. 30093.

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HORRELLSCOPES

BY EDWARD HORRELL

In communications today, it takes more than just good business sense to survive; it requires celestial guidance.



Pisces: The water sign that senses the waves of the future is swimming along with Seiko Time Corp. and AT&T.

Those born under the sign of Pisces are known to receive telepathic messages and to be able to charge the atmosphere with dynamic impulses. And true to their signs, Seiko, the watch people, and AT&T, the layoff people, have come together to form a 15-year joint development agreement to produce a nationwide paging system that uses wristwatches as paging units.

This strategy sounds like a Dick Tracy comic strip.

The new watches will cost about $50 each, and the service will cost 25 cents per message and $5 per month.

Marketing should begin in 1988 — provided, of course, AT&T doesn't lay off all the geniuses needed to get the job done.



Scorpio: The strong and volatile sign is also renown for perfect timing.

And that best describes the latest moves by Image Data Corp. of San Antonio, Texas.

In the aftermath of Federal Express Corp.'s Zapmail fizzle, Image Data has enhanced its product, the Photophone, to be more than just a telephone with pictures.

Instead, increased user interest in the facsimile business, an interest that should be credited to Zapmail, caused Image Data to develop a combination Picturephone and facsimile service.

Federal Express indicates that up to 10% of its shipments are of the "show me" variety — shipments of parts or devices to be shown to a prospect or customer.

Image Data feels that the Photophone, coupled with a facsimile device, will service this market nicely. Now the "show me" can be pictures made to the satisfaction of the recipient.

Image Data is another good example of a smart company taking technology and hitting the market at just the right time.



Aquarius: The laid-back sign of homecomings welcomes those who wanted to own their telephones and computers and now only want the peace and quiet of renting systems again.

Computer businesses that survived by selling equipment are now planning to live by renting it.

More and more companies are gearing up rental programs. But, for users, an additional benefit is that many rental companies will assume responsibility for the ongoing management of the system.

One does not need a telescope to observe that both interconnect companies and computer vendors are interested in this new order of the universe. Both industries expect rental plans to help them fend off starvation during the current buying slump.



Taurus: Under the sign of great zeal, MCI Communications Corp. is cutting red tape to the minimum.

Unfortunately, as a result of its zeal, the company's profits have also been cut — by 41% as of the third quarter. MCI is in trouble.

This report comes on the heels of cost reductions by AT&T and strong recent major account gains by U.S. Sprint Communications Co., which is surely the comeback king of the telecommunications universe.

Layoffs at MCI are closer than the nearest star. With 16% ownership in MCI, IBM is getting as nervous as an astronaut with a low fuel tank. MCI, which once stood for money coming in, now stands for money crisis impending.

Stargazers should watch for new advertising emphasis, new products and beefed-up major account selling.

Horrell is president of Mitchell & Horrell, Inc., a telecommunications consulting firm in Memphis, Tenn.



Gemini: Fueled by twin desires to get out of the communications business and to upgrade and expand their communications technology, colleges and universities are creating the hottest new market in telecommunications.

Institutions of higher learning are currently generating sparks in the computer and telephone systems markets.

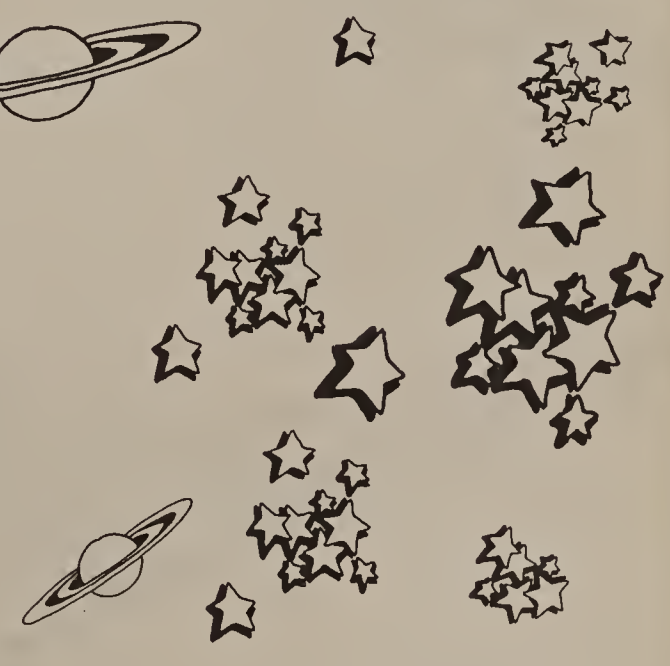
AT&T has announced a new service for universities called the AT&T college and university system (ACUS). This system allows AT&T to manage the college telecommunications department, while charging a fee for taking over responsibility for billing, fee collection and network management. ACUS is a result of AT&T's purchase of Campusnet, Inc., a firm that had sold about 13 such systems.

The concept of turning the hassle over to someone else is staging a comeback in the business community, too. Until a few years ago, most businesses rented their telephone systems from the local telephone company.

That option faded in the light of deregulation, tax advantages for purchases, price slashing by vendors and the desire of business users to be in control of their own telecommunications destiny.

The fact that most businesses weren't equipped or trained to dial a telephone properly or command a computer seemed to make no difference.

However, like the afternoon sun, the possession obsession has burnt itself out. The combination of the tax reform bill and the continuing frustrations of dealing with numerous vendors has renewed interest in equipment rentals.



Cosmic catastrophe of the month

Horrellscopes' first two-time winner of the year, the private pay phone industry, has reared its ugly head yet again.

This time the pay phone industry is involved in scandal regarding fraud — as in users cheating pay phone owners out of money for calls. More and more pay phone owners are discovering their customers can figure out how to break the phone code and make free calls — calls the owner of the phone has to pay for.

Owners of customer-owned coin-operated telephones should be extremely careful to investigate the safeguards the sets offer to protect against fraud. And beware the soothing voice of the vendor. Check with other owners of the same type of telephone who have had the phones for a while. They'll know if fraud is a problem.

Also, ask about profits. Then ask how much is being spent by the phone owner to cover customer fraud and insurance.

These pay phone projects may just be more expensive than they are profitable. And they are definitely in the running for cosmic catastrophe of the year.

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